

EVERY TEACHER A TEACHER OF READING?:
A SYSTEMATIC LITERATURE REVIEW OF CONTENT-AREA LITERACY

A Dissertation

by

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ABSTRACT

Appropriate preparation for preservice and inservice teachers for teaching content-area literacy continues to influence twenty-first century research agendas. In this systematic review (which analyzed 2,179 articles), the researcher aimed to ascertain and synthesize the research on teacher preparation for content-area literacy instruction while evaluating the methodological qualities of the research. The findings are presented in an article format with the connecting theme of content-area literacy; however, the first article focused on research regarding preservice teachers and the second article on inservice teachers. Whereas, previous reviews have primarily focused on secondary teacher beliefs and attitudes this review provides a broader scope of the research, which encompasses K-16 preservice and inservice teachers' beliefs, attitudes, instructional practices, strategies, and knowledge of content-area literacy instruction. The major findings from research on preservice teachers are: with a minimum of one content-area literacy course, this teacher preparation may prove to be less than sufficient; in addition, preservice teachers' beliefs regarding content-area literacy are typically positive, but actual transference once in the classroom is narrow. The major findings from the inservice article suggest the need for further training, modeling, and collaboration of literacy instruction for implementation in content classes. Inservice teachers, albeit experts of their content are restricted by their own motivation and knowledge of literacy strategies, therefore literacy implementation during class instruction is restricted. By reviewing longitudinal and current research as well as building upon previous reviews,

these articles closely examine preservice and inservice teacher preparation, instruction, and implementation of literacy instruction in the content-area class.

DEDICATION

To my heroes, I miss you daily; love you, Nana and Aunt Gladys.

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CHAPTER I

INTRODUCTION

Every Teacher a Teacher of Reading

“Every teacher a teacher of reading” is the mantra stated by Gray in 1925; furthermore, it is a philosophy which continues to influence education, teacher preparation, and reading instruction (Moore, Readence, & Rickelman, 1983). Despite more than a century of debate, both the resistance and support for reading instruction in content classes is current and relevant (Bean, 1997; Fisher & Frey, 2008; Hollingsworth & Teel, 1991; O’Brien & Stewart, 1990; Wilson, Konopak, & Readence, 1993). Research demonstrates that the current role of content-area literacy is an ongoing and prevalent conversation (e.g., Bean, 1997; Durkin, 1978-1979; Moore, Readence, & Rickelman, 1983; O’Brien & Stewart, 1990; Shanahan & Shanahan, 2008). Tovani (2004) describes a typical professional development exchange:

I walked into the room and had barely put my presentation materials on a table before I was verbally accosted by a large man. He told me he couldn’t teach his kids how to be better readers. “Sure you can,” I said, trying to be reassuring. “Oh, yeah? Then you tell me how I’m supposed to teach reading when students don’t have to read in my class.” “Don’t read? What do you teach?” (p. 23)

Flanigan and Greenwood (2007) depict a more complex frustration that was expressed by a content-area teacher:

I know that they’re not learning the words. Or not learning them well enough.

The glossary definitions aren't enough. Some might learn them short term, but they don't remember them six weeks, or even six hours, later. The ones they do remember are the ones that keep coming up. That's why they remember them. But with the state proficiency tests, I've got a lot to cover. I can't spend a lot of time using all of those vocabulary strategies I've learned in workshops, like concept mapping. I'd like to, but I can't do them with every single vocabulary term I've got to cover—they take way too much time.... This year, I'm going to start teaching fewer words so I can spend more time on the important ones, but I'm not sure if what I think is an important vocabulary word is really that important. (p. 226)

Accordingly, appropriate preparation for preservice and inservice teachers to teach content-area literacy continues to influence 21st century research agendas.

Learning to Read, Reading to Learn

The role of content-area reading can better be understood by situating this concept within the overall reading development process. Reading acquisition is an ongoing process through which emergent readers typically evolve into readers of narrative texts and instructional readers of expository texts (Spor & Schneider, 1999). From the progressive “learning to read” development of elementary instruction to the “reading to learn” of advanced grades (Stewart, 1990), the theme that reading is not an isolated learning experience is prevalent. Traditionally, content-area literacy research has primarily focused on secondary-level instruction, but more recently, researchers Pearson

and Duke (2002) have refocused attention upon content-area reading instruction in elementary classrooms.

The transition from *learning to read* to *reading to learn* is supported through content-area literacy instruction and practices. The content-area literacy process empowers students to develop as readers, learners, and thinkers (Lesley, 2004), and it provides teachers and students with resources to construct and co-construct knowledge through interaction with reading and writing (Fisher & Ivey, 2005). Moreover, Vacca and Vacca (2005) purport that content-area literacy promotes reading, writing, oral language, listening, and viewing to learn a specific subject matter. Distinctly, disciplinary literacy (Shanahan & Shanahan, 2008) is the method of incorporating research-based, content-specific literacy strategies into the instruction and practices of content curriculum (Zygouris-Coe, 2012).

Researchers as Advocates of Content-Area Literacy Instruction

Despite the importance and relevance of content-area literacy teacher preparation, a systematic or seminal review of the research has yet to be compiled. Previous related reviews do, however, provide pertinent results and frameworks for these studies. For example, a methodological analysis conducted by Lysynchuk, Pressley, d'Ailly, Smith, and Cake (1989) examined 37 experimental studies of reading comprehension strategy instruction in terms of criteria for both internal and external validity. The researchers concluded that all examined studies fell short in a minimum of three of the validity criteria (e.g., provide examples of validity criteria). As such, these findings provide evidence that “it is critical for reading comprehension researchers to

attend more closely to the methodological considerations” (Lysynchuk et al., 1989, p. 468). Therefore, these reviews provide a close analysis of methodological quality. More recently, Risko et al. (2008) conducted an analysis investigating reading teacher education and preparation, with a focus on research quality. Their work contributed to the conceptual framework and situated methodological foundation for the current systematic reviews and served as a guide for these studies.

Additional research on content-area literacy was supported by the seminal works of Durkin (1978-1979) and Herber (1970). Similarly, the National Reading Panel’s (2000) guidelines for reading instruction, the position statement on adolescent literacy by the International Reading Association (2012), the National Institute for Literacy (2007) report on content-area teachers’ knowledge, and the standards established by the Common Core State Standards (CCSS) all support content-area literacy, either directly or indirectly.

Statement of the Problem

Learners need to have strong reading and writing skills in order to be successful in all realms of life, including school and work (Alliance for Excellent Education, 2011; Biancarosa & Snow, 2004). However, surprisingly, there are exceptionally high numbers of students, specifically adolescents, who are unable to master the appropriate reading and writing skills (Alliance for Excellent Education). Due to the low achievement scores for literacy skills and continued lack of improvement in reading and writing among adolescent students, the National Association of State Boards of Education (NASBE, 2006) purports that the need for connecting reading and writing across the disciplines

and curriculum is clearly evident. The use of content-area literacy and comprehension instruction promotes skills to support student learning in reading and writing (NASBE). Despite national attention focused on literacy development in general, and adolescent literacy in particular (NICHD, 2000), nearly 8.7 million students in grades 4 through 12 lack reading and writing skills. According to the results of the 2009 National Assessment of Educational Progress (NAEP), for example, fourth-grade students' reading scores in 2011 were higher than in 1992, but the results were not statistically different (NAEP, 2011). These students require remediation, especially in the area of text comprehension (Biancarosa & Snow, 2006). Regardless of extensive efforts, students are unable to reach the literacy demands of the information age (Alvermann, 2002). Moreover, much evidence demonstrates that teacher preparation, teacher knowledge, and instructional effectiveness of content-area literacy strategies are highly influential in adolescent learners' literacy achievement (Risko et al., 2008). Teachers should be prepared to effectively facilitate adolescent students' needs to reach high levels of literacy in all disciplines. Therefore, this component of teacher preparation should be considered a critical link in addressing students' lack of content-area literacy skills.

When considering such systematic and complex problems as literacy underachievement by adolescents, it is important to consider the historical shifts within the field. Reading instruction and adolescent literacy have experienced considerable change in focus throughout the past thirty years (Spor & Schneider, 1999), largely in response to several national reports. First, *A Nation at Risk* (National Commission on Excellence in Education, 1983) and *The Reading Report Card: Progress Toward*

Excellence in Our Schools (National Assessment of Educational Progress, 1985) focused on how reading gains had been stagnant since 1971 (U.S. Department of Education, 2000). Next, the *No Child Left Behind* Act of 2001 (U.S. Department of Education) mandated that state educational systems close the achievement gap of students by monitoring and demonstrating annual yearly progress. More recently, *Reading Next: A Vision for Action and Research in Middle and High School Literacy* (Biancarosa & Snow, 2006) outlined the optimal literacy development for secondary students as they face the challenges of more complex subject matters.

Along with the changes in literacy instruction that were implemented in response to national reports, the focus shifted in the 1970s from instructional reading practices in content areas to revisions in certification requirements for secondary teacher training and licensing programs (Bader, 1975). These changes, initiated by individual state certification agencies, frequently included additional reading course requirements for elementary and secondary certification (Bader & Pearce, 1983; Stieglitz, 1983). A more recent shift was seen in response to the Common Core State Standards (NGA & CCSS, 2010) that were established to advance educational outcomes in the U.S.

Although there has been much effort toward educational reform, recent numbers are staggering: upwards of 70% of adolescent students are struggling (e.g., students are reading below grade level) to read today (NASBE, 2006) as opposed to 54% of students reading below grade level in 1972 (Morgan & Kahsar, 1977). Further statistics, as reported by the Alliance for Excellent Education (2007, 2011), and the National Endowment for the Arts (2007) and the U.S. Department of Education (2000), report

that reading achievement among adolescent students, although not declining, is exhibiting little evidence of improving. Moreover, data reported by the National Center for Education Statistics (2007), Alliance for Excellent Education (Biancarosa & Snow, 2006), and the National Assessment of Educational Progress (Lee, Grigg, & Donahue, 2007) reinforce the adolescent literacy crisis and reported results of reading failure, as the following facts demonstrate:

- In grades 4-12 nationwide, there are approximately eight million struggling readers.
- Thirty-eight percent of fourth graders in U. S. schools read below the basic level—meaning, they are unable to read and comprehend a short text sample.
- Middle school children who read well will be exposed to 10,000,000 or more words during the academic school year, while children who struggle with reading will read less than 100,000 words each school year—equivalent to one percent of what good readers encounter.
- Two-thirds of students in the eighth and twelfth grades read below the proficient (e.g., defined as a “solid academic performance”) level.
- Nearly 60% of secondary school students in reading achievement score below the proficient level.
- Despite efforts of literacy researchers and educators, reading instruction and content-area literacy continue to be met with resistance from preservice and inservice content area teachers (U.S. Department of Education, 2000; Loomis &

Bourque, 2001, p. 2; Lyon, 2001; NCES, 2003; Alliance for Excellent Education, 2007, 2010; NAEP, 2007; Zygmouris-Coe, 2012).

Thus, there is a national call for improving literacy instruction, particularly at the secondary level (Nourie & Lenski, 1998). Researchers (e.g., Nokes, 2010; Snow, 2002; Tovani, 2004; Vacca & Vacca, 2005) maintain that students who engage in literacy strategies within content-area instruction will develop a deeper understanding of the content; therefore, literacy should be considered a school-wide issue. Such sentiments echo Gray's original mantra of "every teacher a teacher of reading" (Moore et al., 1983). Unfortunately, resistance from content-area teachers to incorporate reading and literacy as part of curricular practice (Alger, 2009) prevents barriers from being broken and inhibits students from attaining the highest level of literacy.

Teacher preparation and inservice training is the logical venue for proactively addressing teachers' resistance to teaching content-area literacy strategies. Therefore, researchers (e.g., Darling-Hammond & Youngs, 2002; Fisher & Ivey, 2005) continually assert that preservice and inservice teachers need appropriate training to teach and instruct literacy. However, teacher preparation in content-area literacy must do more than address teachers' resistance to or beliefs about literacy practices. Training must also provide future and current teachers with the knowledge and pedagogical tools to implement such practices effectively.

Purpose of the Study and Research Questions

In the context of the previous research regarding literacy, adolescent literacy, content-area literacy, and teachers' resistance to becoming teachers of reading, the

purpose of the present studies is to synthesize the existing body of literature in content-area literacy research as it pertains to teacher preparation and development; therefore, this review evaluated a cumbersome amount of research related to content-area literacy from over four decades. Additionally, studies were evaluated using a methodological quality instrument. Two previously published reviews (Hall, 2005 and Risko et al., 2008) were utilized as guides, but they were also used as a reference of how to make this particular research and argument structure stronger. What follows is a discussion of the distinct differences found between the previously published reviews and this review.

Hall (2005) specifically limits her research agenda to 6-12 content-area teachers' attitudes and beliefs—important to the current research trends and teacher preparation—but does not provide a full gamete of the research within the context of content-area literacy. According to the guiding research questions, Hall reviewed 19 studies, a comparatively small number when compared to the breadth of research available. Additionally, Hall's study does not provide a specific breakdown of inclusionary studies within the two categories (e.g., preservice and inservice), although she does provide the number of teachers within the studies. The database search conducted from 1970 to 2003 needs more fully described justification, as well. Furthermore, the research in this review was based upon meeting the criteria set by the guiding questions; however, a methodological analysis was not conducted.

The review by Risko and colleagues (2008) investigated research related to teacher preparation for reading instruction. As stated in their limitations section, several purposive decisions were made which impacted the study. First, the review only

analyzed studies in English and research conducted in the United States. They justify this process by acknowledging that only additional three studies were identified through their database and the manual journal search. Risko et al., also recognized the limitations represented in the four conceptual categories, stating that other categories represented in study are possible.

In light of these two previous reviews, there is evidence of need for an extensive content-area literacy review. This study addressed relevant content-area literacy issues related to preservice and inservice teachers. In this review, the researcher examined 43 years of research. The timeframe was selected for the following reasons: 1) the research shift in the late 1960s and early 1970s due to the National Council of Teachers of English (NCTE) recognizing the importance of reading in contrast to the previous emphasis on language arts instruction (Alvermann, 2010) and 2) the 1970 publication of Harold Herber's *Teaching Reading in Content-areas*, which was the first published research-based resource providing teachers with literacy strategies for teaching reading in the content areas. Additionally, the researcher evaluated the methodological quality of the inclusionary studies, providing evidence of high-quality research and supporting the need of further research for content-area literacy, preservice teacher preparation, and inservice teacher development.

To answer the questions guiding this research, two independent research endeavors are presented in two separate manuscripts representing Chapters III and IV. Chapter III will be referred to as Manuscript I, and Chapter IV will be referred to as Manuscript II. Manuscript I systematically reviews the current body of literature about

preservice teachers' beliefs, knowledge, and instructional practices for teaching in relation to content-area literacy. Manuscript II systematically reviews the current body of literature about inservice teachers' implementation of instructional practices, beliefs and attitudes, knowledge and teacher quality, and professional development for content-area literacy instruction. The specific research questions for the two manuscripts include the following:

- To what extent does content-area literacy education impact preservice and inservice teachers' education of reading comprehension in the content areas?
- What is the methodological quality of content-area literacy research for preservice and inservice teacher preparation?
- What are the primary themes and trends within content-area literacy research for preservice and inservice teachers?

Definitions of Key Terms

Manuscripts I and II address the instructional practices utilized to teach content-area information and materials while supporting and improving students' literacy skills. Although content-area literacy is not a new area of instruction (Fisher & Ivey, 2005), operational terms must be explicitly defined for these studies. First, *content-area literacy* (CAL) is the umbrella term for the student-centered approach of advocating reading and writing instruction in content-area classes (Fisher & Ivey, 2005).

Researchers Vacca and Vacca (2005) define *content-area literacy* as the ability to use reading, writing, speaking, and listening to learn in the context of a specific content area or discipline; in contrast, *disciplinary literacy* is the instructional method of

incorporating research-based, content-specific literacy strategies into the teaching and practices of content curriculum (Shanahan & Shanahan, 2008). Therefore, *disciplinary literacy* describes the advanced literacy resulting from embedded instruction in content-area classes (e.g., English-language arts, mathematics, science, social studies). *Content-area literacy* and *disciplinary literacy* have much overlap, but the terms are not synonymous. For example, summarizing is a *content-area literacy* practice, which promotes reading comprehension and can be applied to any content. The effective use of an allegory when writing a literature paper demonstrates *disciplinary literacy* since allegories would not be appropriately used when documenting a science experiment.

Next, *reading comprehension*, a cross-curricular concept, is the “process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (Snow, 2002, p. 11). Additional operational terms include *strategy/ies* and *strategic instruction*. *Strategies* are planned procedures, such as cooperative learning, using graphic organizers, predicting, and summarizing (NRP, 2000), designed to help the student reach the learning goal (Gunnings, 2012). Specifically, *reading comprehension strategies* provide skills that teach readers to gain a deeper understanding of the text by preparing, organizing, elaborating, rehearsing, and monitoring their learning (Gunnings, 2012). According to the *What Works Clearinghouse* report (2010), *reading comprehension strategies* (e.g., anticipation guides, questioning, and journaling) are cognitive routines applied by readers before, during, or after the reading of texts. The application of *reading comprehension strategies*

helps readers gain better understanding for the reading process and overcome any weaknesses and difficulties.

Dissertation Format

For the purpose of this dissertation, the journal article format was utilized and divided into five chapters. The journal article manuscript format for *Reading Research Quarterly* was applied to Chapters III and IV; therefore, those two chapters are self-contained works. A brief description of this dissertation's format follows:

- Chapter I provides a general introduction to the topics of the studies and the overall rationale for the dissertation.
- Chapter II presents a historical narrative and a review of related synthesized research of content-area literacy.
- Chapter III (Manuscript I) is a systematic literature review of the current body of empirical literature about preservice teachers' beliefs, attitudes and perceptions, knowledge and reflection, and instructional practices and pedagogy as related to content-area literacy instruction.
- Chapter IV (Manuscript II) is a systematic literature review of the current body of empirical literature about inservice teachers' implementation of instructional practices, beliefs and attitudes, knowledge and teacher quality, and professional development for content-area literacy instruction.
- Chapter V offers a general discussion that connects the two journal articles and presents the findings and the implications for content-area literacy instruction. In

addition, the chapter includes the limitations of the studies and possible directions for the fields of educational and reading research.

CHAPTER II

AN HISTORICAL PERSPECTIVE AND LITERATURE REVIEW OF CONTENT- AREA LITERACY

Introduction

For over a century, scholars have examined the benefits of integrating reading and writing instruction into content-area classes, carving a path for the implementation of content-area literacy requirements in the 1970s (Bean, 2002; Biancarosa & Snow, 2006; Hall, 2005; Herber, 1970; Kamil, 2003; Moore, Readence, & Rickelman, 1983; Shanahan & Shanahan, 2008; Simonson, 1995). In 1961, Harvard University and the Carnegie Foundation recommended that preservice teachers (PSTs) be given preparation in reading instruction in all content-areas, regardless of the grade level of instruction. Primarily neglected to this point, the argument was made that PSTs warranted additional training in this area because reading skills are essential for success in the secondary grades (Usova, 1978).

The Historical Context of Content-Area Literacy Research

Traditionally, literacy scholars have not focused on either teacher preparation or content-area literacy instruction with the same dedicated rigor that has been given to research in basic literacy skills. In the 1970s, explicit interest regarding instructional reading practices in the content areas arose in response to changes in certification requirements (Bader, 1975). These new teaching prerequisites, established in the early 1970s, required elementary and secondary education majors to take a minimum of one

reading methods course (Bader, 1975; Hollingsworth & Teel, 1991; Schleich, 1971; Welle, 1981; Willingham, 2006). Universities responded to the revised requirements by designing reading courses to teach and prepare PSTs to integrate literacy practice with content-area instruction. Therefore, to understand the current status of content-area reading, it is critical to understand the inception and evolution of teaching and learning within content-area reading instruction.

Content-Area Literacy Over the Past Century

From the early 1900's, researchers have investigated the notion of oral reading and silent reading (Simonson, 1995). Such research interests included the following: oral reading and silent reading (Pintner, 1913; Mead, 1915; Simonson, 1995; Thorndike, 1971), reading skills (McClure, 1926), content-area reading instruction (Gray, 1925), reading mechanics, such as vocabulary, constructions, and organization (Thorndike, 1934), and the processes involved in reading.

Starting in 1925, Gray's statement, "Every teacher who makes reading assignments is responsible for the direction and supervision of the reading and study activities that are involved" (p. 71; Siebert & Draper, 2008) generated much attention. Currently, his words are better known as the following mantras: *every teacher a reading teacher* (Siebert & Draper, 2008) or *every teacher a teacher of reading* (Alvermann, Friese, Beckmann, Rezak, 2011a; Moore et al., 1983). The call was supported by the National Committee on Reading, which stressed the need for reading across disciplines (Moore et al., 1983). In 1944, Artley voiced a similar question that continues to be in dispute: Who is responsible for teaching content-area reading? Does this role belong to

the reading teacher, the English/Language Arts teacher, or the content-area teacher (Simonson, 1995)? These sentiments were echoed ten years later when Simpson (1954) argued, “No matter how poorly or how well high-school students can now read, every high-school teacher can help them to read with better understanding the textbook and the other materials that are required in his course” (p. 3). Similarly, Flesch’s (1955) *Why Johnny Can’t Read* and U.S. Education Commissioner Allen’s, (1969) decree that all learners have “The Right To Read” echo these sentiments.

The transition in recognizing the importance of integrated literacy and content-area literacy also recognized the argument that reading instruction was not the sole responsibility for elementary instruction but should extend to secondary levels (Flanagan, 1975). As reading instruction is a multi-level approach, it is not isolated to one level of education; rather, it is a learning continuum needed to traverse new knowledge and the demands of evolving curricula.

The abovementioned paradigm held throughout the 1970s (Flanagan, 1975), and authorities in reading instruction reinforced incorporating literacy into content-area instruction (Durkin, 1978-1979; Hall, 2005; Herber, 1970; Moore et al., 1983). According to Dishner and Readence (1978), content reading had already established a complete trajectory for the “Past. Present! Future?” (p. 78) and has, as a result, generated a vast amount of articles, books, and conference presentations dedicated to reading instruction in content-area classes.

Despite the quantity of content-area research, the impact of such research on classroom instruction remains minimal. One of the original works on the subject of

content-area reading, Harold Herber's (1970,1978) *Teaching Reading in Content Areas*, endorsed the concept of teaching cognitive strategies for building a sense of text for adolescents as they progress through the secondary levels (Moje, 2007).

The concept of secondary reading comprehension was followed by the instrumental, observational research conducted by Durkin and colleagues (1978-1979), in which they evaluated the amount of comprehension instruction in the primary grades. Their findings showed little to no comprehension instruction was witnessed (Durkin, 1978-1979); instead, the majority of instruction was devoted to questioning (Pearson, 1985). To address the instructional deficits and needs for reading instruction revealed by Herber's and Durkin's research, large-scale implementation of school wide programs and teacher preparation programs became more common (Austin, 1961; Braam & Roehm, 1964; Dupuis, Askov, & Lee, 1979; Smith & Otto, 1969).

With their findings, Durkin and her colleagues also encouraged attention for researching the obstacles facing content-area reading implementation and instruction (Gillespie & Rasinski, 1989). According to Gillespie and Rasinski (1989), such problems include both legislative and bureaucratic hurdles coupled with content-area teachers' beliefs and attitudes toward reading instruction (i.e., *resistance*). In 1983, a report by the National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Education Reform*, prompted political involvement and the support of government funding (Gardner et al., 1983).

National Reading Panel and Common Core State Standards

With an increased focus upon the inclusion of content-area reading interests as a valuable asset in both the elementary and secondary level classrooms, Vacca (1998) cautioned against marginalizing adolescent literacy (Richardson, 2008) and addressed the additional needs of adolescent learners beyond the infusion of content-area reading. Transitioning from the strategic reading of the 1990s into the 21st century, the ongoing conversation about content-area reading and content knowledge increased, specifically in response to the enhanced attention upon standards-based assessment with No Child Left Behind Act of 2001 (NCLB) (PL 107-110), was an extension of the Elementary and Secondary Education Act of 1965 (ESEA) and the Reading Excellence Act of 1998, and it was sanctioned with the expectation that all students read proficiently by the end of third grade. The research on teaching literacy evolved, and content-area researchers were primarily focused on the barriers and obstacles faced by PSTs' beliefs and resistance toward integrating literacy practices.

Prior to NCLB, the National Reading Panel (NRP, 2000) report greatly influenced the direction of literacy research and, therefore, research funding. The findings from this two-year meta-analysis recognized five vital components of effective reading instruction. These five components included the following: phonemic awareness instruction, phonics instruction, fluency instruction, vocabulary instruction, and text comprehension instruction (NRP, 2000). Unfortunately, the NRP report's limited attention to PST preparation, content-area literacy instruction, and continuing literacy development lessened research attention in these areas. However, the NRP report

included gaps and controversies. For example, the report only identified certain evidence-based studies, limited to quantitative research studies only.

Additionally, NCLB requirements for highly qualified teachers included the following: a college degree, state certification, and demonstration of content mastery (Porter-Magee, 2004). The most vague and controversial of the three is the latter of the requirements. It requires all new and existing teachers to demonstrate content mastery in order to be considered highly qualified and meet the standards set by NCLB. According to Porter-Magee (2004), the “NCLB’s shift away from certification that includes student teaching and pedagogy courses, mandating that teachers demonstrate content knowledge forces people to rethink what it means to be qualified to teach. Such a shift is unwelcome in many education circles” (p. 27).

Furthermore, loopholes in NCLB persist, for example, if a school’s adequate yearly progress report card label was “In Need of Improvement” or in worst case, “persistently dangerous,” students attending such schools were provided with the option to transfer to another school. A pitfall of this label is that “unfortunately, many states have chosen to define ‘persistently dangerous’ so broadly that few schools receive the label, leaving many poor and minority students stranded in schools with a history of violence” (Porter-Magee, 2004, p. 28). With lingering controversies and states distancing themselves from NCLB, several comprehensive studies have further examined literacy and literacy instruction (NEA, 2013). Such studies include the following: *Knowledge to Support the Teaching of Reading, Theoretical Models and Processes of Reading* (5th ed., 2005), *The Handbook of Research on Teaching the*

English Language Arts, (2nd ed., 2003), and *The Handbook of Reading Research* (Vol. III, 2003).

More than 10 years later, reading instruction and practices have moved beyond the NRP report and are heavily influenced by the legislation of the Common Core State Standards (CCSS), produced by the Council of Chief State School Officers (CCSSO) and National Governors Association Center for Best Practices (NGA). The CCSS's intended purposes are to help teachers prepare students with the knowledge and skills needed to be successful learners with the support of clear goals (CCSSO & NGA, 2010). Additionally, the standards offer continuity between schools, as well as state to state (CCSSO & NGA, 2010). As of early 2013, 46 states and five territories have adopted all or part of the CCSS. Although a few states have not formally adopted the CCSS, legislative shifts and revisions have moved their current curricula in similar directions (e.g., Texas's recently revised English Language-Arts and Reading Standards also emphasize that students engage in increasingly complex texts [TEA, 2011]).

Common Core State Standards and Literacy Instruction

In terms of literacy instruction and content-area literacy, the CCSS address specific literacy issues related to reading more challenging texts, promoting advanced literacy, and applying key aspects to reading conventions necessary to content-area reading (CCSSO & NGA, 2010; IRA, 2012). Rather than focusing solely on the key aspects of reading development for K-5 instruction using the five essential components of effective reading recognized by the NRP, the CCSS apply to reading in grades 2-12. This broader range of grade levels reflects the stance of the International Reading

Association (IRA, 2012). The IRA advocates instruction that engages students in the reading process with a variety of written texts and levels. The CCSS for English Language Arts represent the “effort to fulfill the charge issued by the states to create the next generation of K–12 standards in order to help ensure all students are college and career ready in literacy no later than the end of high school” (CCSSO & NGA, 2010, p. 3). Therefore, the advent of the CCSS brings renewed attention to content-area literacy and teacher preparation. By applying the CCSS, students are afforded the opportunities to learn from wide ranges of texts, therefore providing students with the experiences of analyzing primary and secondary sources. Through exploring all content-areas, students gain access and build knowledge in all areas of work and academic disciplines, and “students learn through reading domain-specific texts in history/social studies, science, and technical subjects and by writing informative/explanatory and argumentative pieces” (CCSSO & NGA, 2010, p. 3).

According to the standards outlined by the CCSS, comprehension instruction should concentrate on goals and learning outcomes (CCSSO & NGA, 2010). Teachers should provide students multiple opportunities to read text and pay attention to meaning through critical discussions. Furthermore, the integration of strategies, such as summarizing, asking questions, using text structures, visualizing, and comprehension monitoring, further develop the learning process. This integration promotes critical thinking skills, invites interpretation, and challenges the reader to think independently (IRA, 2012).

The Transition to Disciplinary Literacy

More recently, disciplinary literacy has emerged as a unique entity. It is related to content-area literacy, but it denotes a more developed and alternative perspective than content-area literacy. According to Shanahan and Shanahan (2008), the recently coined phrase “disciplinary literacy” (p. 40) describes the advanced literacy resulting from embedded instruction in content-area classes (e.g., English-language arts, mathematics, science, social studies). Disciplinary literacy, then, goes beyond the tools used to learn the disciplines and expands to the “literacy skills specialized to history, science, mathematics, literature, or other subject matter” (Shanahan & Shanahan, 2008, p. 44). Literacy instruction facilitates but does not compete with the learning of the content (Hall, 2005).

This distinction brings the “who teaches reading” argument full-circle. Artley (1944) originally posed this question over 60 years ago, but the continuous question among researchers and teachers still stems from the integration of reading and content-area instruction. Disciplinary literacy standards have now incorporated the instruction of reading and writing into the content classrooms (e.g., English-language arts, mathematics, social studies, science, and technical subjects; CCSSO & NGA, 2010; IRA, 2012). Moving away from the instruction of literacy basics, disciplinary literacy instruction introduces students to the problem solving and specialized thinking taught in grades 6-12 (IRA, 2012).

Accordingly, for the purpose of this review, the studies and research focus will reflect on the instruction of content-area literacy. Although disciplinary literacy is a

recognized term, research on disciplinary literacy does not exhibit the same breadth as is found with the more foundational focus of content-area literacy skills and direct research to preservice and inservice teachers (Moje, 2008; Pytash, 2012; Shanahan & Shanahan, 2008).

Previous Reviews of Content-Area Literacy Research

After an initial exhaustive and systematic search, several published literature reviews regarding content-area literacy, content-area instruction, and comprehension strategy instruction were identified (e.g., Gillespie & Rasinski, 1989; Lysynchuk, Pressley, d'Ailly, Smith, & Cake, 1989; Hall, 2005; Moje, 2007; Siebert & Draper, 2008). Although each review examined components and characteristics of reading comprehension and content-area literacy instruction (e.g., content-area literacy and mathematics teachers, disciplinary literacy teaching, attitudes, beliefs and change, and attitudes and practices), they differ from this review. Specifically, the majority of the other reviews did not evaluate the methodological quality of the research, only one study focused attention to the specific qualities of the research (e.g. validity [Lysynchuk et al., 1989]). Additionally, select previous reviews addressed mathematics (Siebert & Draper, 2008), teachers' beliefs and attitudes (Hall, 2005) or attitudes and practices (Gillespie & Rasinski, 1989). In contrast, this review identified and evaluated systematically all peer-reviewed research for the past 43 years, addressing all characteristics of content-area literacy from kindergarten to post-secondary education, including all content-area classes (e.g., art, English-language arts, foreign languages, mathematics, science, social studies, reading instruction and teacher preparation). The 43-year span was identified by

the researcher was due to the changes made by the National Council of Teachers of English (NCTE) in 1969, when the council founded the Commission on Reading, which recognized the importance of reading in contrast to the previous emphasis on language arts instruction (Alvermann, 2010). In addition, Harold Herber published *Teaching Reading in Content-Areas* in 1970, a book that was the first published research-based resource providing teachers with literacy strategies for teaching reading in the content areas. In the following section, the most relevant reviews will be highlighted to demonstrate the need for the present study and to acknowledge the influences upon it. The reviews are presented in chronological order. Although these reviews provide strong evidence for content-area literacy instruction, only one review addressed the methodological quality of the relevant research.

Content-Area Teachers' Attitudes and Practices Toward Reading

First, Gillespie and Rasinski (1989) explored the attitudes and practices of content-area teachers regarding reading in the content areas. This review examined 16 studies pertaining to the attitudes of content-area teachers, as well as the teachers' attitudes toward teaching reading in content-area classes. Gillespie and Rasinski reviewed studies, the studies were classified into three specific categories related to content-area teachers (1) studies that tried measured teachers attitudes, (2) studies that examined teacher attitudes and practices, and (3) studies that evaluated teacher attitudes before and after completing a content-area course. Rather than focusing on one category of content-area literacy, this particular review evaluated all studies directly and indirectly related to PSTs and content-area literacy, including: beliefs and attitudes,

knowledge, strategies, and implementation practices. Additionally, the authors did not apply any methods of research quality to their study. The Gillespie and Rasinski (1989) study reported that reading instruction for content-area teachers proved to be beneficial for teacher attitudes and practices related to teaching reading. In summary, the authors concluded that an increase in reading pedagogy could positively impact teacher attitudes and practices toward the instruction of content-area reading.

Methodological Analysis of Comprehension Strategy Instruction

In the same year, Lysynchuk et al. (1989) published a methodological analysis of experimental studies evaluating comprehension strategy instruction. Although they did not directly analyze content-area literacy instruction, Lysynchuk and colleagues evaluated 37 reading comprehension studies from 1977 to mid-1988, and they specifically focused on both internal and external validity of the studies. The validity criteria included the following elements: general design; confounds (which incorporated materials), participant or subject information, treatment conditions; measurements, and statistics (referring to probability of Type 1 errors), and the appropriate statistical tests. From this research, the authors concluded that, in general, all the studies failed to meet at least three areas of validity: (a) not addressing long-term effects or transfer to instruction, (b) seldom providing delayed measures, or (c) not assessing the transfer from newly learned reading strategies to instructional materials. Additionally, many studies were fundamentally flawed experiments, meaning they did not meet the methodological standards addressed in this particular review. In comparison, Lysynchuk et al. and this review both conducted a form of methodological research quality

assessment. However, Lysynchuk et al. narrowed their research specifically to reading comprehension strategy instruction, while content-area literacy was utilized for this review.

Teachers and Content-Area Reading

Hall (2005) evaluated studies on preservice and inservice middle and high school content-area teachers' beliefs and attitudes regarding teaching reading in the content area. Hall also examined studies on preservice and inservice content-area teachers' motivation for teaching reading or opting to not teach reading in the content-area classes (2005). Specifically, Hall examined 19 studies published between 1970 and 2003 that focused on teaching content-area literacy in grades 6-12. According to her research, the majority of the PSTs displayed positive shifts in their attitudes toward teaching reading in the content-area classroom, and the shift in attitude can be attributed to the content-area reading courses required for PSTs. Yet, the findings concluded the positive attitudes of the teachers did not always transfer from pre-service preparation into classroom instruction. In contrast to PSTs, inservice teachers' (INSTs') attitudes regarding teaching reading showed positive outcomes only when the teachers were given ongoing support, saw the instruction as part of the curriculum, and were given time to learn how to teach reading within the content. Hall (2005) concluded that although PSTs and INSTs hold a range of beliefs regarding content-area literacy and their roles as teachers, their foundational beliefs vary, whereas PSTs ground their knowledge in prior experiences and INSTs recognize the need to teach a variety of students and reading abilities.

In comparison to this systematic review; the focus of Hall's research agenda was on the beliefs and attitudes of teaching content-area literacy in grades 6-12. Next, the scope of the search was limited to 1970-2003. While teachers' beliefs and attitudes, are critical for content-area instruction, the consideration of teacher attitudes is the isolation from teacher knowledge and practices limits the practical implications of Hall's reviews. Accordingly, to obtain a richer understanding of the field, this research aimed to consider multiple components relevant to content-area literacy in concert with each other.

Developing Socially Just Subject Matter Instruction

Moje (2007) conducted a literature review on disciplinary literacy teaching and focused on subject-matter instruction within the secondary and postsecondary classes. Moje initially retrieved 1,037 articles, books, and edited volumes, many of which were not relevant. Therefore, Moje opted to highlight specific studies and to focus only on a small sample. Unfortunately, she did not provide the exact number of studies analyzed—which extended to programs of research or studies that made a contribution to the field. She (2007) concluded that “young people need to have access to the conventions of disciplinary knowledge” that provide “young people the power to read critically across various texts and various disciplines” (p. 37). Since Moje's review and focus is on the infusion of “socially just subject-matter instruction at the secondary and postsecondary level” (p. 1), particular in disciplinary teaching, there is little comparison between Moje's review and this review.

Why Content-Area Literacy Messages Do Not Speak to Mathematics Teachers

Most recently, Siebert and Draper (2008) presented the findings of a critical analysis, which analyzed the literacy messages of content-area literacy from mathematics educators' perspectives. The analysis examined the following four types of literature: (a) texts, (b) literature consisting of position statements, (c) influential works on content-area literacy instruction, and (d) literature used as a tool to convey the importance of literacy instruction to content-area teachers. The authors concluded that, from mathematics teachers' perspectives, the literacy message interpretations commonly have negative connotations for mathematics instruction (Siebert & Draper, 2008). The natural outcome of this negativity is that mathematics teachers often find implementing content-area literacy instruction irrelevant to their instruction and discipline.

The Collective Thoughts of Previous Research Reviews

The collective material from these reviews provides a wide array of research regarding reading and content-area instruction. The related reviews focused on comprehension strategy instruction (Lysynchuk et al., 1989), preservice and inservice beliefs and attitudes (Gillespie & Rasinski, 1989; Hall, 2005), disciplinary literacy instruction (Moje, 2007), and content-area teacher perspectives (Siebert & Draper, 2008). Thus, the current study will examine and review the literature using the focus on preservice and inservice teachers' beliefs and attitudes, knowledge, and instructional practices of content-area literacy. Additionally, the study will examine the quality of the research represented in the literature, which was not a practice conducted in the other reviews.

With years of research and myriad publications in reading comprehension, content-area literacy, and the instructional practices of preservice and inservice teachers, present research lacks a cohesive study that examines multiple components of preservice and inservice teachers' preparation in connection to content-area literacy. Current initiatives, such as the CCSS, identify a need for research-based practices to support students' content-area literacy skills and, therefore, call for teacher preparation to teach such skills. However, is the research supporting this need? This systematic review will examine the past and current research and will also present the methodological qualities of the studies.

Contributions from Additional Content-Area Literacy Research

Consistent with previously presented literature reviews, work in content-area literacy and reading comprehension in content classes has been strongly influenced by recommendations based on research and reviews conducted by the National Reading Panel (NRP), the National Institute of Child Health and Human Development (NICHD), and the International Reading Association (IRA). While not focused exclusively upon content-area literacy, the NRP subreport on text comprehension sought to identify general "reading comprehension strategies to guide and improve reading comprehension" (NICHD, 2000, p. 2). The findings emphasized a list of 16 strategies focusing on cognitive processing important for monitoring comprehension (Willingham, 2006). Similarly, the 2007 NICHD report *What Content-Area Teachers Should Know About Adolescent Literacy* reviewed research (although limited) that addressed the need for improving the reading and writing skills of adolescent learners and provided

recommendations for instruction. Lastly, the *Adolescent Literacy: A Position Statement of the International Reading Association* (updated in 2012) provides a thorough guide that offers support for adolescents' ongoing literacy and personal development (IRA, 2012). Therefore, these reports identify the need for an inclusive review, which evaluates the research and the quality of research reported on content-area literacy.

CHAPTER III

PRESERVICE TEACHERS' BELIEFS AND ATTITUDES, KNOWLEDGE, AND
INSTRUCTIONAL PRACTICES OF CONTENT-AREA LITERACY:
A SYSTEMATIC LITERATURE REVIEW

Introduction

For decades, researchers have focused on teaching reading comprehension (Lysynchuk, Pressley, d'Ailly, Smith, & Cake, 1989; Pearson, 1985) and the strategic instruction of content-area literacy, which are critical components of a more fundamental goal—the need for effective reading instruction at all levels of education (Usova, 1978). Ultimately the goal in teaching reading is to increase students' abilities to read above a basic level and reach deeper levels of meaning construction. Similarly, since reading development is a continuous process, it must be acknowledged that literacy and academic demands differ drastically between primary-level students and secondary-level students (Alexander & Jetton, 2000; Moore, Bean, Birdyshaw, & Rycik, 1999). Unfortunately, formal reading instruction typically ends in the primary grades. Therefore, since literacy researchers recognize the discrepancies (including the range of reading abilities and needs to take meaning from text) in secondary students' reading abilities, educational researchers encourage integrating reading comprehension and literacy strategies into content-area classes as a means to improve or enhance students' reading abilities (Hall, 2005). Therefore, content-area reading serves as an imperative response to students' needs for a myriad of techniques and strategies when they read,

write, and study specific disciplines. Likewise, the effective preparation of content-area literacy is imperative.

Previous Reviews of Content-Area Literacy Research

This review, of preservice teacher preparation for content area literacy, extends and expands upon previous reviews, and therefore, it is important to situate this work within similar studies. Prior to commencing this study, an initial systematic search yielded several published literature reviews regarding content-area literacy, content-area instruction, comprehension strategy instruction, and preservice teachers were identified (e.g., Hall, 2005). Although other tangentially related reviews were also found (e.g., Gillespie & Rasinski, 1989; Lysynchuk et al., 1989; Moje, 2007; Siebert & Draper, 2008), the inclusion of preservice teachers was not a concentration of that research.

Specifically, this review systematically synthesizes previous research, that examined content-area literacy instruction (e.g., practices, strategies, training) used to teach content-area instruction and reading comprehension in content-areas (e.g., English-language arts, mathematics, science, social studies, music, foreign languages) addressing teacher preparation and all characteristics of content-area literacy from kindergarten to post-secondary education.

Evidence of Educational Research and U.S. National Reports

In the following section, the (five) most relevant reviews and national reports will be highlighted to show the need for the present study and to acknowledge the influences upon it. Although the previous research, as a whole, provides a strong

evidence for content-area literacy instruction, there is limited research on teacher preparation for content-area instruction.

Much work in content-area literacy and reading comprehension in content-area classes has been guided by recommendations based on research and reviews conducted by the National Reading Panel (NRP), the National Institute of Child Health and Human Development (NICHD), and the International Reading Association (IRA). While not focusing on content-area literacy, the NRP report subcomponent on text comprehension sought to identify general “reading comprehension strategies to guide and improve reading comprehension” (NICHD, 2000, p. 2). The findings emphasized a list of 16 strategies focusing on cognitive processing, particularly those important for monitoring comprehension (Willingham, 2006). Similarly, the 2007 NICHD report *What Content-Area Teachers Should Know about Adolescent Literacy* reviewed research (although limited) that addressed the need for improving the reading and writing skills of adolescent learners and provided recommendations for instruction. Lastly, the *Adolescent Literacy* position statement endorsed by the IRA (updated in 2012) provides a thorough guide that offers support for adolescents’ ongoing literacy and personal development (IRA, 2012).

Review of teachers and content-area reading. More germane to teacher preparation, Hall (2005) evaluated studies on preservice and inservice middle and high school content-area teachers’ beliefs and attitudes regarding teaching reading in the content-area. Specifically, Hall examined 19 studies published between 1970 and 2003 that focused on teaching content-area literacy in grades 6-12. According to her research,

the majority of the preservice teachers (PSTs) displayed positive shifts in their attitudes toward teaching reading in the content-area classroom and the shift in attitude can be attributed to the content reading courses required for PSTs. Although, the findings concluded that the positive attitudes of the teachers do not always transfer from pre-service preparation into classroom instruction. In contrast to PSTs, inservice teachers' (INSTs) attitudes regarding teaching reading showed positive outcomes only when the teachers were (a) given ongoing support, (b) saw the instruction as part of the curriculum, and (c) were given time to learn how to teach reading within the content. Hall (2005) concluded that although PSTs and INSTs hold a range of beliefs regarding content-area literacy and their roles as teachers, their beliefs vary—whereas PSTs ground their knowledge in prior experiences as a learner and INSTs recognize they need to teach a variety of students and reading abilities.

Although Hall's review and the national studies provide ample research in instructional practices for reading comprehension and adolescent literacy, they do not provide an extensive systemic review of the strategies for *preparing teachers to implement* reading comprehension instruction and content-area literacy strategies in content-area instruction. Frequently, research on teacher preparation is often a missing link in educational research. The field tends to focus on research of instructional practices but fails to then translate that research back to the classroom. Alternatively, teacher preparation can be seen as a separate research field that is not given the same level of attention as straightforward as literacy research. Therefore, the need for a comprehensive search was deemed necessary.

Seminal Study

In 2008, Risko and colleagues published *A Critical Analysis of Research on Reading Teacher Education*. This analysis provided an extensive review of 82 empirical studies on teacher preparation for reading instruction conducted in the United States. The research conducted by Risko et al. served as the foundational framework and the seminal study (concept and methodology) for the current systematic review. Nevertheless, the current work differs primarily from Risko and colleague's review because of the focus on teacher preparation for *content literacy instruction*, rather than reading instruction in general.

Building upon the concept and format of the 2008 Risko et al. study, the purpose of this review was two-fold: first, to synthesize content-area literacy instruction in reference to teacher preparation for the past 43 years, and second, to evaluate the identified studies with regard to their methodological criteria. By assessing the strengths and weaknesses of the cumulative research, the intent is to be able to utilize a critical lens to offer insight into the past, present, and future of content-area literacy teacher preparation research.

Present Study

Purpose

Researchers in the field of literacy education have long supported the teaching of literacy strategies and practice in content classrooms (e.g., English-language arts, math, science, social studies, and so on), which fosters student comprehension of content curricula (Durkin, 1978-1979; Herber, 1970; Readence, Bean, & Baldwin, 1998). In

contrast, there is relatively limited research regarding teacher preparation to instruct content-area literacy skills compared to the research base directly measuring content-area literacy instruction. Therefore, the purpose of the current study was to make relevant links between improving literacy instruction and content-area literacy. This review systematically synthesizes the research, from the past 43 years, that examined content-area literacy instruction (e.g., practices, strategies, training) used to teach content-area instruction and reading comprehension in content-areas (e.g., math, science, language arts, history, music, etc.) for PST preparation.

In an attempt to make connections from the research to practice, this review evaluates a cumbersome amount of research related to content-area literacy. The review presents the research published over four decades and provides an in-depth analysis of the research that met quality standards. Two previously published reviews were utilized as guides, but they were also used as a reference for how to make this research and argument stronger. Distinct differences were found between the previously published reviews, Hall (2005) and Risko et al. (2008).

Hall (2005), specifically limited her research agenda to 6-12 grade level content-area teachers' attitudes and beliefs—important for the current research trends and teacher preparation, but does not provide a full gamut (or survey) of other relevant topics within the context of content-area literacy, such as teacher knowledge and preparation. In contrast, the review by Risko and colleagues (2008), specifically investigated the research related to teacher preparation for reading instruction but did not focus on content-area literacy. However, with continued research evaluating reading and content-

area instruction, along with the demands of new technology, content-area literacy is a viable research agenda; therefore, the current review addressed the following questions:

- To what extent does content-area literacy education impact preservice teachers' instruction of reading comprehension in the content areas?
- What is the methodological quality of content-area literacy research for preservice teacher preparation?
- What are the primary themes and trends within content-area literacy research for preservice teachers?

Methods

The systematic review method involves four phases: (1) searching and identifying studies, (2) a multi-step screening process of identified studies according to a pre-determined set of inclusionary and exclusionary criteria, (3) the methodological analysis of the selected studies according to a pre-determined set of quality indicators, and (4) a descriptive synthesis of the selected studies in a qualitative overview of the findings (Torgerson, Porthouse, & Brooks, 2005).

This study employed the systematic review process (e.g., Hannes, Claes, & Belgian Campbell Group, 2007; Risko et al., 2008; Torgerson, 2007) to synthesize findings for the past four decades regarding PST preparation in content-area literacy instruction. Specifically, the implementation of reading and writing practices for teaching English-language arts, mathematics, science, and/or social studies is described through the synthesis of empirical (e.g., studies that report original research; American Publication Association, 2010), peer-reviewed studies.

First, however, this study encompassed one large database search of inclusionary studies. At the start, the search process involved looking for studies with both preservice and inservice teachers. The findings were then separated after they had been screened at the abstract and full-text levels. Those findings were then further screened and, organized by either preservice or inservice teachers. This review included only those studies including preservice teachers. Although this study does not evaluate the research of inservice teachers (inservice teachers are addressed in a separate study), the term was included in the original search.

Review of Inclusion and Exclusion Criteria

To be included in this review, articles had to meet the following five inclusionary criteria: (1) published in English; (2) published in a peer-reviewed journal; (3) published between the years of 1969-2012¹; (4a) examined empirically the topic of reading comprehension for content-area instruction, (4b) study conducted and data collected in the United States, (5a) examined content-area literacy instruction, (5b) analyzed reading comprehension in content-area instruction; and (5c) analyzed the instructional practices of preservice teachers. Additionally, since the database search took place on June 11,

¹ The researcher selected the initial year to conduct the search for this review because 1969 was when the National Council of Teachers of English (NCTE) founded the Commission on Reading, which recognized the importance of reading in contrast to the previous emphasis on language arts instruction (Alvermann, 2010). In addition, Harold Herber published *Teaching Reading in Content-areas* in 1970, which was the first published research-based resource providing teachers' with literacy strategies for teaching reading in content-area.

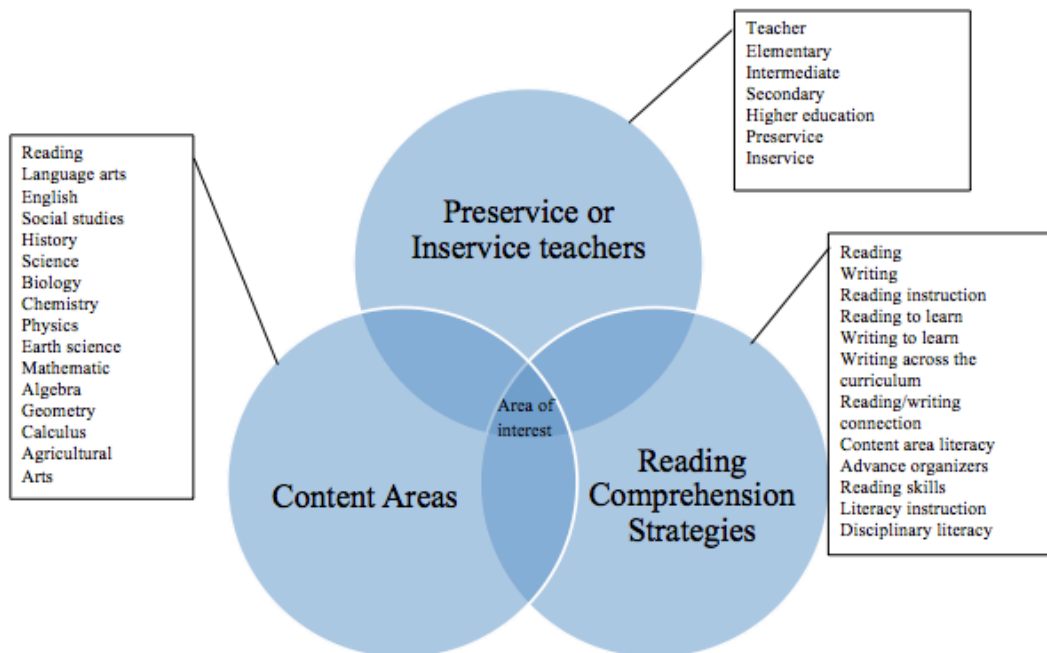
2012, and the manual Scopus search was concluded on December 27, 2012, articles published after this secondary date were not included in the review.

Search Methods and Keywords

The first process for acquiring the studies for this review was a comprehensive database search of studies published between 1969 and 2012. The electronic databases ERIC (Educational Resources Information Center), PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, and ComDisDome were utilized to explore the relevant literature and studies regarding reading comprehension in content-area classes for PSTs.

Primary database search. The primary ERIC database search for this review used the following key words or phrases: (a) content-area literacy and content-area reading, (b) reading comprehension strategies, and (c) preservice teachers. Figure 3.1 provides a visual depiction of the advanced term search. The original three terms were then expanded upon using synonyms. For example, *content-area literacy* was searched by the specific content-areas of language arts, social studies, science agriculture, biology, chemistry, geometry, mathematics, art, drama, music, and physical education. When possible, these specific content terms were also broken down further, such as mathematics (algebra, calculus, geometry), science (physics, biology, anatomy, STEM), and social studies (civics, anthropology, political science, economics, history, geography). The exhaustive list of original and expanded terms are documented in Figure 3.1.

Figure 3.1. Diagram of Search Terms (Preservice)



The remaining two search terms were deconstructed in an analogous manner. *Reading comprehension strategies* included: reading, writing, reading instruction, advance organizers, reading skills, literacy skills, and literacy instruction. And *preservice and inservice teachers* were expanded with: teacher, secondary, higher education, preservice and inservice (with and without the hyphen). The final step in the key term search included a truncation process. Truncation is a process that uses words or symbols to replace letters with words (Colorado State University Libraries, 2012), thus expanding the search. Terms truncated in this search included: strateg, read, teach, and instruct.

Secondary database search. Upon concluding the ERIC search, additional databases were searched: PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, ProQuest Professional Education, and ComDisDome. As described previously in the primary ERIC search, the same key term, secondary key term, and truncation searches were conducted.

Scopus search. A secondary database search was conducted through SciVerse Scopus, an abstract and citation database used to identify additional studies for review. This comprehensive database searches and identifies citations and references from the reference list of an original study and provides secondary and tertiary citations.

Manual search. After concluding exhaustive database searches, a manual hand-search for inclusionary studies was conducted at the citation level. The journals were hand-searched because the previously extracted studies were published in them: *Action in Teacher Education*, *Insight: A Journal of Scholarly Teaching*, *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *Journal of Adolescent & Adult Literacy*, *Journal of Educational Research*, *Journal of Reading*, *Journal of Science Teacher Education*, *Literacy Research and Instruction*, *National Reading Conference Yearbook*, *Reading Horizons*, *Reading Improvement*, *Reading Psychology*, *Reading Research and Instruction*, *Reading Research Quarterly*, *The Clearing House*, *The Teacher Educator*, and *Teacher Education and Practice*.

Screening Criteria

After concluding all database searches, the selection process included several steps. First, each article was evaluated using the following screening questions for inclusion:

1. Is the article published in English?
2. Is the article published in a peer-reviewed journal?
3. Is the article published between 1969-2012?
4. Is the article:
 - a. an empirical study?
 - b. based on data *collected* in the United States?
5. Is the primary focus of the article/research:
 - a. to examine content-area literacy instruction?
 - b. to analyze reading comprehension in content-area instruction?
 - c. to analyze the practices and instruction of preservice teachers?

For studies to be included in this review, retrieved articles underwent a screening process. The inclusion process was completed through close examination and screening of the articles according to the criteria listed above.

Articles obtained from the database, Scopus, and manual searches were initially screened at the abstract level. Articles meeting all eight criteria at the abstract level moved to a secondary screening. The secondary screening used the same eight criteria, however, the articles were screened at the full-text level.

Methodological Quality Questionnaire Screening

The final screening process evaluated the articles for quality. To assess the methodological quality of the studies, an instrument titled the Methodological Quality Questionnaire (MQQ), was adapted from the screening tool used previously by Risko et al. (2008), in addition to referencing a MQQ instrument implemented by Acosta and Garza (2011) in their research of evidence-based pedagogy. Each of the studies selected for inclusion from the previously mentioned criteria, was then analyzed for quality and effectiveness using all seven quality indicators (Risko et al., 2008). The MQQ followed the premise of Risko et al., with the following modifications: (a) Criteria 1.1 now states “explicated theory and /or previous research” instead of “theory and previous research.” (b) Criteria 2.2 was split to standards 2.2 and 2.3 to allow reliability and validity to be analyzed as separate components. (c) Criteria 2.4 now requires more details regarding the participants in the reviewed studies. For example, Risko et al. (2008) required “describes participants” (p. 43). Furthermore, for this study, Criteria 2.4 is more exacting and states that the participants and sample must be characterized by age/grade/instructional level (if applicable). For preservice teachers, the study should include the level of instruction and the course(s) of instruction (e.g. methods course). (d) Additionally, criterion 3.1 and criterion 3.2 were merged into one criterion. Originally, criterion 3.1 stated, “Findings are consistent with intention of question/purpose,” and criterion 3.2 stated, “Findings are legitimate or consistent for data collected” (Risko et al., 2008, p. 256). Criteria 3.1 now states, "Findings and conclusions are legitimate or consistent with data collected.” In summary, this study added one criterion and excluded

another from the original criteria published by Risko et al.; therefore, the original number of seven criteria remains the same for both studies.

Additionally, modifications were made to the original scoring process. Originally, Risko et al. (2008) only included studies in their review that met all seven criteria, and “the articles were assigned an overall score of 3 (meets all criteria), 2 (meets between four and six criteria), or 1 (meets three to zero criteria)” (p. 256). For this review, modifications were made to the Risko et al. scoring system. The revised scoring process included the following three options: (a) studies meeting all seven criteria were included in the study; (b) studies falling into a score range from 4-6 were re-evaluated by the researcher at a later time period; and (c) a score of 1-3 automatically excluded an article from the current study. This was changed prior to measuring for quality, to limit the additional steps (See Table 3.1). The MQQ displayed in Table 3.1 describes the seven criteria used to assess the methodological quality. The quality indicators were applied to all inclusionary articles in order to determine the overall methodological quality of each study. After reviewing the studies, the raters marked the study with the appropriate score, ranging between a score of 1-7, within the overall scoring of 1—exclude, 2—re-evaluate, and 3—include. The studies were then assigned an overall score of 3 (meets all criteria), 2 (meets between four and six criteria), or 1 (meets three to zero criteria; Risko et al., 2008). Only studies that met all seven of the quality criteria were included in this review; finally, all studies with a score between four and six criteria were re-evaluated. Any additional discrepancies were revisited and discussed until consensus was reached between the two raters.

Table 3.1 Methodological Quality Questionnaire (Preservice)

Standard	Quality Criteria
Standard 1: Provides a clear argument that links theory and research and demonstrates a coherent chain of reasoning. Explicates theoretical and previous research in a way that builds the formulation of the question(s).	1.1 Explicates theory and/or previous research in a way that builds the formulation of the question. Poses a question /purpose/objective that can be investigated empirically.
	1.2 Explicitly links findings to previous theory and research or argument for study.
Standard 2: Applies rigorous, systematic, and objective methodology to obtain reliable and valid knowledge relevant to education activities and programs.	2.1 Ensures that methods are presented in sufficient detail and clarity to clearly visualize procedures (another person could actually collect the same data). Data collection should be described that readers can replicate the procedures in a quantitative study and follow the trail of data analysis in a qualitative study. For a qualitative study, researcher should report some of the following: number of observations, interviews, or documents analyzed; if interviews and observations are taped and/or transcribed; the duration of the observations; diversity of material analyzed; and the degree of investigator's involvement in the data collection and analysis.
	2.2 Evidence of <i>reliability</i> ? Was this evidence provided from the data collected (e.g., describe coefficients, test-retest, Cronbach's alpha)? Did the researchers provide information about instrument development and study populations (e.g., content-area literacy strategies)? For qualitative studies were characteristics provided: reliability, credibility, and/or trustworthiness were addressed and reported?
	2.3 Was evidence of <i>validity</i> provided for data collected (e.g. instrumentation-does it measure what it is designed to measure and accurately performs the function)? Information about instrument development and adaptations for specialized populations (e.g., content-area literacy strategies). For qualitative studies were characteristics provided: reliability, credibility, and/or trustworthiness were addressed and reported?
	2.4 Describes participants and the sample was well characterized? (<i>Description must include all of the following: age/grade/instructional level or type of PST/INST and content-area-if necessary</i>).
Standard 3: Present finding and make claims that are appropriate to and supported by the methods that have been employed.	3.1 Findings and conclusions are legitimate or consistent with data collected.

Adapted from Risko et al. (2008)

Results

The preliminary database search yielded 1,506 articles from the five electronic databases: ERIC (Educational Resources Information Center), PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, and ComDisDome. An additional 673 articles were retrieved through other searches (e.g. Scopus and manual searches). In total, 2,179 articles were screened. The breakdown of the database search and the article retrieval is detailed below in Table 3.2.

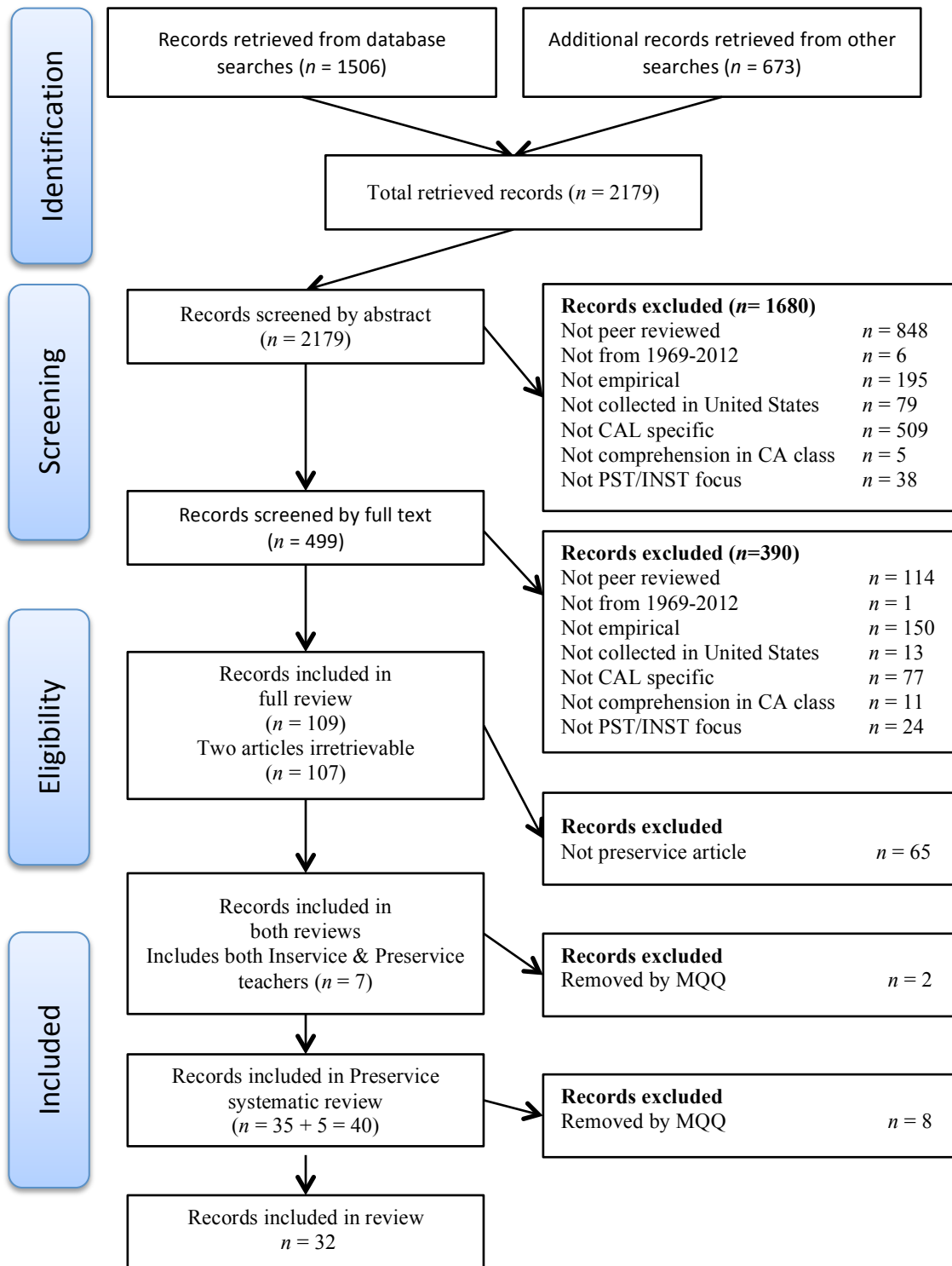
Table 3.2 Article Retrieval Breakdown (Preservice)

Retrieval Source	Retrieved Articles
ERIC (Educational Resources Information Center)	1483
PsycINFO (a database of psychological information)	6
Linguistics and Language Behavior Abstracts	10
ProQuest Education Journals	6
ComDisDome	1
SciVerse Scopus	648
Manuel hand-search	25

First, all articles were screened at the abstract level (Petticrew & Roberts, 2006; Torgerson, 2003). This screening eliminated 1,680 articles from the review. The majority of the manuscripts eliminated from the review did not meet criterion 2, which required the studies to be published in a peer-reviewed journal ($n=848$), such as the journals *Reading Research Quarterly* and *Literacy Research and Instruction*, rather than book chapters or conference presentations. Criterion 4a ($n=195$) removed articles due to

the lack of empirical research, such as practitioner-oriented articles. Any studies that collected data outside of the United States were eliminated for criterion 4b ($n=79$). Articles not meeting criterion 5a ($n=509$) were studies that did not focus on the instruction of content-area literacy (see Figure 3.2). The remaining articles ($n=499$) were then screened at the full-text level to assess full eligibility. The articles were screened using the same initial inclusionary criteria and questions. During the secondary screening, the majority of articles were excluded due to the lack of empirical research ($n=150$), followed by criterion 2 ($n=114$) not published in a peer-reviewed journal, and 5a ($n=77$) the study does not examine content-area literacy instruction. The full-text screening resulted in 109 studies, including studies addressing preservice and inservice teachers. However, two documents were unobtainable, therefore, 107 studies were screened at full-text screening. For the purpose of this review, of the 42 final studies included in the methodological quality review, 32 focused exclusively on PSTs and five evaluated both preservice and inservice teachers, after evaluating for methodological quality, the final inclusive number in the review was 32.

Figure 3.2 Flow Diagram of Article Selection Process (Preservice)



Moher et al, 2009.

Reliability

For reliability, the use of inter-raters was employed at several stages during the research process (during the abstract phase, the instrument phase, and for the research design coding). First, after the original database search was completed, a total of 2,179 articles were screened at the abstract level. At this stage, the author with the assistance of two doctoral students from literacy education evaluated approximately five percent ($n=62$) of the studies. The doctoral students, who had previously earned Masters degrees in education, were in their first or second year of a doctoral program. Both were enrolled in research methods and statistics courses, with experience evaluating research from a methodological and academic lens. Training was conducted with the inter-raters and the researcher. The training was conducted by looking at the preliminary screening criteria questions as a team and evaluating studies based on the questions prior to working individually, upon training completion, each rater applied the same screening questions to the randomly selected studies. A 92% rate of reliability was reached between the three raters.

At the next level, full text screening, the articles were reviewed on the seven criteria of the MQQ individually. Once each study was evaluated, the raters assigned an overall score of 1-7 and indicated whether the study received a score of one to three (to exclude), a score of four to six (requiring the study to be re-evaluated), or a score of seven (indicating inclusion). For inter-rater reliability, an assistant professor of literacy education from another university, classified as a Tier 1 research institution, and with experience conducting systematic literature reviews, assisted with the coding. To insure

for replicability with the original instrument from Risko et al. (2008) studies included in both the Risko et al. review and this particular review ($n=4$) (Bean, 1997; Konopak, Readence, & Wilson, 1994; Nourie & Lenski, 1998; O'Brien & Stewart, 1990) were analyzed first to help the raters with training and reliability. Furthermore, raters were required to provide documented evidence (e.g., rationale) for each of the seven quality criteria on the MQQ. In the training phase, the two raters initially evaluated the same five articles. Each article was evaluated based upon the seven MQQ criteria, resulting in possible score of 35 out of 35 criteria. Upon completion and discussion of coding, inter-rater reliability was 89% overall. In order to test for inter-rater reliability, coding was conducted over the course of the research; an additional sample ($n=2$) was analyzed. The agreement among the reviewers for the MQQ instrument and each of the seven criteria was 13 out of 14, a 93% agreement rate.

Method for Data Analysis

The final screening process evaluated the methodological quality of the studies ($n=42$), with the implementation of the MQQ. As previously stated, upon completing the MQQ for the 42 studies from the secondary screening, 32 met the MQQ criteria and were included in the final review. Of the final set, six were quantitative, 23 were qualitative, and three used a mixed-methods approach. This preponderance of qualitative methodology (approximately 72%) is comparable Risko et al.'s findings (2008), where approximately 62% of the final inclusive studies were qualitative.

Following the parameters applied by the Risko et al. (2008) study, this review also analyzed the specific research topics identified in the studies. This analysis

produced 18 themes: attitudes, beliefs, conceptions, effectiveness, experiences, knowledge, perceptions, practices, implications, instructional methods, multiple literacies, orientations, strategies, strategy selection, metacognition, misconceptions, and resistance. Next, the analysis was redefined (Risko et al., 2008) by identifying the studies conceptual foci. As the purpose of this particular study was to evaluate studies with the foci on content-area literacy, three categories emerged from the abovementioned themes: (a) preservice teachers' beliefs and attitudes; (b) preservice teachers' knowledge and reflection; and (c) preservice teachers' instructional practices and pedagogy. (See Table 3.3).

Table 3.3 Foci of Content-Area Literacy Research (Preservice)

<u>Study</u> <i>Author(s), year-alphabetical</i>	<u>Beliefs & Attitudes</u>	<u>Knowledge & Reflection</u>	<u>Practices & Pedagogy</u>
Akerson, V. L. & Flanigan, J. (2000).	Perceptions		Practices
Alger, C. L. (2007).		Knowledge (understanding)	Pedagogy
Alvermann, D., Friese, E., Beckmann, S., & Rezak, (2011a).		Knowledge (understanding)	Practice (online professional development)
Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b).		Reflective	Practices (online learning)
Bean, T. W. (1997).	Beliefs		Practices
Conley, M. W., Kerner, M., & Reynolds, J. M. (2005).		Knowledge (understanding)	Practices (tutoring) Pedagogy
Cox, B. E., Fang, Z., Carriveau, R., Dillion, D., Hopkins, & Nierstheimer, S. (1998).		Knowledge (construction)	Practices (field-based)
Daisey, P. (2009).	Beliefs	Attitudes	
Daisey, P. (2012).	Beliefs (predictions) (enthusiastic)		Practices (field experiences)
Donahue, D. (2003).		Knowledge	Reflection (metacognition) Pedagogy

Table 3.3 Continued

Study Author(s), year-alphabetical	Beliefs & Attitudes	Knowledge & Reflection		Practices and Pedagogy	
Dowdy, J. K. & Campbell, D. (2008).		Knowledge	Reflection (writing)		
Feret, A. J., & Smith, J. J. (2010).		Knowledge	Reflection (writing)	Practices (field-based)	Pedagogy
Freedman, L. & Carver, C. (2007).	Beliefs	Knowledge			
Fritz, A. E., Cooner, D., Stevenson, C. (2009).	Attitudes				
Hollingsworth, S., & Teel, K. (1991).	Beliefs			Practices	
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994).	Beliefs				
Lesley, M. (2004).			Reflection (critical literacy)		
Lesley, M. Watson, P., & Elliot, S. (2007).	Beliefs	Attitudes	Reflection (metacognitive)		
Nokes, J. D. (2010).		Knowledge (inquiry)	Reflection	Practices (field-based)	Pedagogy
Nourie, B. L. & Lenski, S. D. (1998).	Attitudes				
O'Brien D. G., & Stewart, R. A. (1990).	Perspectives (resistance)				
Olson, M. R. & Truxaw, M. P. (2009).		Knowledge (meta-knowledge)		Practices	
Pytash, K. E. (2012).			Reflection (writing)	Practices	
Reinke, K., Mokhtari, K., & Willner, E. (1997).	Perceptions				
Sheridan-Thomas, H. K. (2007).		Knowledge (understanding) (construct)	Reflection	Practices (apply)	
Stewart, R. A. (1990).	Belief (resistance)				
Stewart, R. A. & O'Brien, D. G. (1989).	Beliefs	Attitudes	Knowledge		
Sullentic-Dowell, M. M., Beal, G. D., & Capraro, R. M. (2006).	Attitudes				
Warren-Kring, B. Z. & Rutledge, V. C. (2011).	Attitudes				
Welle, D. W. (1981).	Attitudes				
Wilburne, J. M. & Napoli, M. (2008).	Beliefs	Knowledge			

The three categories were administered as a tool to help define and align the research and the analysis of the studies. Although it is evident the data set could be organized differently, the use of a seminal study aided the researcher in systematically organizing the studies.

Limitations of the Research

This review is one portion of a larger study in which the researcher attempted to systematically ascertain the research on content-area literacy as a whole, while evaluating the methodological qualities of the research and studies. Hence, this review has several limitations. First, as specified in one of the original inclusionary criteria, this review was limited to only including studies conducted with data collected in the United States. This decision followed the guidelines of the Risko et al. (2008) study, and the purposeful decision of the researcher. Yet, several excluded studies were conducted in foreign countries, such as Taiwan, Turkey, Canada, Australia, and Great Britain.

An additional limitation is the amount of studies included, particularly those using quantitative methodologies. The final number of inclusionary studies for this review was 32, down from the original number of 2,179 studies. Implemented research methods may have been a contributing factor; whereas, the majority of the research was qualitative in nature and determined by the research question. This limitation obviously reflects the status of the field, and limits the ability of the current research to draw overarching conclusions in this specific area of interest. For example, while the majority of this review analyzed research conducted for secondary instruction, there is little that can be compared between elementary and secondary level instruction.

Even with studies excluded for specific criteria, I believe the research purpose, questions, issues, and results of this review reflect the current and relevant research surrounding content-area literacy and preservice teacher preparation. The methods employed in this study may be beneficial for future research and researchers who conduct research investigating content-area literacy and preservice teacher preparation in their country or in other countries. This review provides additional understanding of the methodology for conducting a systematic literature review.

Next, the organization of the review focused around the three conceptual categories: beliefs and attitudes, knowledge and reflection, and instructional practices and program implementation. These categories emerged from the inclusionary studies and the intentions of the researcher. In addition, it is necessary to acknowledge that other categories or organizational patterns are highly plausible, depending upon the research questions and the research agenda of the researchers.

Finally, this review is limited to the research focusing on reading comprehension, content-area literacy, and preservice teachers. The inclusionary research is restricted by the specified criteria, as the search was not limited to a particular grade level or content-area. The majority of the research is in the genre of preservice preparation, methods courses, and grades reflective of content-area literacy instruction.

Findings

The inclusive studies were organized into categories that represent the conceptual foci of the studies and are presented below.

Descriptive Characteristics of Studies

In order to develop a deeper understanding of the research and the studies included in this review, identifying characteristics were coded as: participant population and characteristics, research method and analysis, setting, and the researchers' role. This descriptive data was used to characterize the overall content of the studies reviewed.

One hundred percent of the studies focused on preservice teachers, with five studies also including inservice teachers. Additionally, there was variability within the category of preservice teachers. First, the studies were sorted by the levels of instruction: (a) undergraduate versus graduate, (b) a combination of both undergraduate and graduate, or (c) fifth year teacher certification programs (Post-Baccalaureate). In the studies, 20 (63%) involved undergraduate students, five evaluated both preservice and inservice teachers, four were conducted in 5th year programs, three included both undergraduate and graduate students, and one involved only graduate students enrolled in a masters or degree completion program.

The next characteristic, setting, described the type of instructional experience where studies were conducted. The predominate type of course instruction was a content-area literacy or a reading methods course, ($n=24$; 75%). Though, other instructional experiences included a series of courses combining math and reading ($n=2$), science and reading ($n=2$) studies, a literacy series ($n=2$), a social studies methods course ($n=1$), and a language arts methods course ($n=1$).

By considering these instructional settings by category, the number of courses conducted within content specific courses was seven (22%). When accounting for

intended grade level of instruction, 28 (88%) studies evaluated courses for secondary majors and only four in the elementary majors.

Additional characteristics gathered from the descriptive categories include whether the study explicitly stated the researcher's role or the role of additional researcher(s) in the investigation. Twenty-seven (84%) of the researchers participated in the study (instructor-participant), three (9%) researchers did not specify their role in the study, and two (6%) stated their role as an assistant of the instructor.

In summary, the research represented in this review primarily documented the preparation of preservice, undergraduate secondary education in content-area literacy methods courses. The majority of researchers were identified as the course instructor.

Findings from Research on Beliefs and Attitudes

In order to present a cohesive review, the emerging themes are organized to characterize the knowledge gained from this body of work. The majority of the studies, $n = 17$ (53%), concentrated on preservice teachers' beliefs, attitudes, or perceptions about reading and literacy instruction in content-area literacy classes—in contrast to teachers' knowledge or practices. Conversely, researchers rarely defined the constructs of beliefs or attitudes. The definitions of the beliefs and attitudes were generally implied in the study title, the research questions, and/or the presented findings. With trends in education research and specifically reading research (Fang, 1996), as terms that imply teachers' beliefs or behavior regarding a specific construct, researchers may deem it unnecessary to define at this point in the research. According to Harste and Burke (as cited in Fang, 1996) teacher expectations regarding student behavior and the guidance of

instruction is based on teachers' philosophical principles and belief systems. Therefore, in this section, I present the findings as two sub-categories: beliefs and resistance to change, and beliefs and positive response to literacy instruction. These two categories were derived from the Risko and colleagues (2008) review and draw similarities between the studies and the research.

Beliefs and resistance to change. Consistent with findings by Risko and colleagues (2008), many studies examined PSTs' beliefs in conjunction with integrating reading instruction into content literacy. The research reviewed in this study implies there are mixed reactions or beliefs with regard to reading instruction and content-area learning. Typically referred to as resistance (Bean, 1997; Nourie & Lenski, 1998; O'Brien & Stewart, 1990; Stewart & O'Brien, 1989), researchers have worked to find the cause and solutions to this recurrent trend. The following studies, summarized in Table 3.4, demonstrate an array of research on PSTs' beliefs and resistance to content-area literacy. I will highlight these studies organized by the resistance, a topic that permeates the research, and conclude with the research that is signifying a positive response to literacy instruction.

In terms of representing the range of PSTs' beliefs, first, O'Brien and Stewart (1990) investigated 250 PSTs' nature of resistance to content reading instruction and found that 50% of the PSTs had reservations and resisted the reading foundations necessary in content-area reading courses. The majority of the resistance was due to misconceptions of the PSTs roles during instruction, the role of reading in content classes, and the confusion between learning-to-read and reading-to-learn. Specifically,

PST teachers' misconceptions of content-area reading were strongly related to "global misconceptions and immutable assumptions about school life" (O'Brien & Stewart, 1990, p. 122), and therefore these instructional practices were viewed as incompatible and unnecessary for the teaching content material.

In juxtaposition, two different groups of PSTs were examined. It was discovered that PSTs who participated in a reading methods course have more compatible views of content teaching and literacy integration (Nourie & Lenski, 1998). The findings suggested that the majority of the PSTs, with a positive attitude of integrating reading and writing in content instruction, also reported a positive attitude about their content-area literacy course. Unfortunately, the results also concluded that their literacy course had little impact on developing the PSTs' attitudes toward reading. In general, according to Nourie and Lenski (1998), participants reported that they valued reading and were active readers.

Stewart and O'Brien (1989) and Stewart (1990) collected similar types of data from undergraduate, graduate, and certification students enrolled in a required content-area-reading course. The specific purpose of the Stewart and O'Brien study was to gain a better understanding of PSTs' attitudes, beliefs, and knowledge pertaining to the course. From 100 questionnaires, sampled from a larger set, Stewart and O'Brien (1989) found that upon completion of the course, most students retained only minimal misconceptions about content-area reading instruction.

Notwithstanding, Stewart (1990) discovered what he deemed "Constraints in the Workplace" (p. 58) in that PSTs felt victimized by the constraints of teaching,

specifically related to time. That is, the PSTs recognized the benefits but felt that content learning would be limited by the time demands needed for reading integration.

Constraints in the workplace or classroom similarities are drawn from the work of Bean (1997), PSTs knowledge, selection, and beliefs have an explicit impact on the instruction of reading in the content-area class.

In summary, PST beliefs are correlated to their practices and literacy instruction in content classes. Through course requirements, PSTs are provided with opportunities to learn reading instruction, but if they do not believe they are responsible for this aspect of teaching, literacy will likely be void from their instruction.

Table 3.4 Summaries of Studies—Beliefs

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Perceptions Strategy selection</u>	<u>Study Findings</u>
Akerson, V. L. & Flanigan, J. (2000)	PST N=23 Language arts methods course	QUAL Writing logs and journals, videotaped class explorations	Content categorical analysis	Practices	PSTs' recognized the importance of writing in journals for better understanding. Using language arts can help teach science, and PSTs were comfortable with their instruction. PSTs recognized that by integrating English-language arts in science, it provided more time for content instruction. The PSTs journals provided evidence that English-language arts was a tool to learn in the content area and a way to teach content

Table 3.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Perceptions Strategy selection</u>	<u>Study Findings</u>
Bean, T. W. (1997)	PST N=27(17F, 10M) Content area methods course	QUAL Interviews	Constant comparative analysis	Strategy selection & Beliefs	PSTs experiences with selecting content area reading materials and instructional strategies was provided flexibility across the discipline; and the 10 participants interviewed, were more selective and narrow in their strategy use. Also, external variables impede strategy selection.
Daisey, P. (2009)	PST N=124 (67 F, 57 M, 116 C, 8 AA) Content area methods course	MIXED Pre, mid, post, and follow-up Surveys, open-ended and likert, student quotes	Frequency Chi-square Analysis of variance, constant comparison analysis	Attitude Beliefs	Findings suggest secondary PSTs that reflect upon their own positive experience with reading may benefit their teaching for future classes and students.
Donahue, D. M. (2000)	PST N=10 Content area methods course	QUAL Case study Reading journals and inquiry projects	Inductive coding: patterns	Beliefs	PSTs valued reading, but did not value the reading instruction needed for science classes. PSTs balanced the interest of promoting reading and science materials. The PSTs learning with journals provided a new appreciation of reading, rather than just a technical tool.
Freedman, L. & Carver, C. (2007)	PST N=66 students over 5 semesters. But for this article N=32 Art education Content area methods course during student teaching	QUAL Students' written work, field-based reflective essays, self-assessments, reading logs, child study reports, and a unit plan.	Action research study, narrative analysis to analyze written text and grounded theory	Knowledge Strategies	Through field-based reflective essays, self- assessments, reading logs, child study reports, and unit plan PSTs began making connections between literacy strategies and learning strategies and recognized the importance of scaffolding and modeling strategies for students to implement. Participants gained the necessary knowledge of theory and practices to facilitate learning for student in content knowledge.

Table 3.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Perceptions Strategy selection</u>	<u>Study Findings</u>
Fritz, A. E., Cooner, D., Stevenson, C. (2009)	PST N= 84 Content area methods course	QUANT Pre and post- questionnaire, three open-ended questions.	Descriptive statistics, factor analysis, reliability analysis, and analysis of variance	Attitudes Beliefs Knowledge Perceptions	PSTs overestimate their understanding of literacy strategies prior to taking a content area reading / literacy methods course. Upon completion PSTs intention to incorporate literacy strategies increases and the participants' attitudes is positive, with ELA teachers the strongest of the beliefs in engaging students' prior knowledge.
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994)	BOTH N=125 pst and inst teachers representing 10 areas, 58 pst and 46 inst secondary teachers education Content area methods course	QUANT Kinzer's (1989) instrument adapted Belief statements, lesson plans	Chi-square	Beliefs Orientations	With several limitations, results indicated difference between the groups' orientations. PSTs favor interactive explanation of how reading happens, INSTs favored reader-based. For beliefs about reading, both PSTs and INSTs showed significant results for the reader-based orientations. The findings provide support that suggest that theoretical orientations of reading processes of teachers' reflects their instructional decision making process.
Nourie, B. L. & Lenski, S. D. (1998)	PST N= 90 and 113 (2 groups) Content area methods course	QUANT Pre- and postattitude surveys	Frequency data	Attitudes	No difference from pre to post-survey scores. Both PST and INST are still resistant to content literacy as an instructional approach, but he findings indicated that the participants have favorable attitudes toward teaching reading strategies in the content area class.

Table 3.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Perceptions Strategy selection</u>	<u>Study Findings</u>
O'Brien D. G., & Stewart, R. A. (1990)	BOTH N=245 PSTs and 5 teachers Content area methods course	QUAL Precourse statements, surveys, learning logs, interviews	Constant comparative analysis	Resistance	Resistance to CAR instruction: is based on global perceptions and viewed incompatible. Based; on simple misconceptions; what appears to be resistance is a broader complex of PST's assumptions.
Reinke, K., Mokhtari, K., & Willner, E. (1997)	PST N= 123 elementary education majors approx. age = 21 Methods courses (reading, mathematics, and integrated reading & math for elementary majors	QUANT Pre- and post perception surveys	Repeated measures multivariate analysis of variance	Perceptions	Math, reading, and writing in the classroom was positive among the participants, and positive perception change for improving reading skills led to a better understanding of mathematics, and improve math problem solving. No significance of perceptions for integrating reading and math methods subject.
Stewart, R. A. (1990)	PST N= 200+ Under-graduate and graduate education majors Content area methods course	QUAL Four data sources: group discussion; narrative evaluations; academic journals, interviews.	Constant comparative analysis, content analysis, triangulation	Resistance	Emerged categories: constraints of the workplace (time constraints and socio/political factors). Although they recognized the benefits, PSTs felt constricted by time to cover content and teach reading. Content area literacy was not perceived as a feasible pedagogical tool in realities of the class and workplace constraints.
Stewart, R. A. & O'Brien, D. G. (1989)	PST N=100 from a random sample of 3 semesters, total of 12 courses at 15-25 students each session. Content area reading course	QUAL Questionnaire, journals, open-ended questions, interviews	Generative and exploratory analysis- comparison, grounded theory	Attitudes Mis- conceptions Resistance	Content area reading instruction misconceptions are prevalent with PSTs entering a content reading course. Upon completion, misconceptions are no longer present, but when in the teaching situation, there may be limited opportunities for strategy incorporation.

Table 3.4 Continued

<u>Study</u> <i>Author(s), year- alphabetical</i>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u> <i>Attitudes Beliefs Perceptions Strategy selection</i>	<u>Study Findings</u>
Wilburne, J. M. & Napoli, M. (2008)	PST N=8 Mathematics methods course	QUAL Interviews, reader response journal / notebook, written responses pre and post, mathematical autobiography, field notes, lesson plans.	Thematic and categorical coding	Beliefs Knowledge	Eight PSTs in ELA and mathematics methods courses show a significant positive shift in the participants' beliefs, interest, and benefits of teaching math with the support of literature.

Beliefs and positive response to literacy instruction. In response to legislation mandating content-area literacy courses for PSTs, much immediate (and continuing) research evaluated the impact of these required courses—particularly in terms of reducing resistance. While results are mixed, trends reveal that content-area literacy courses reduced resistance and improved attitudes towards literacy (Daisey, 2009; Donahue, 2000; Welle, 1981; Wilburne & Napoli, 2008). In the following sections, I summarized major related findings from a range of content areas and methodologies.

Beginning in 1981, Welle noted that secondary majors, and even faculty, questioned the need for content-area literacy. Despite initial reservations by PSTs, her findings revealed positive attitude changes toward content-area reading from the beginning and end of the course. However, the attitude improvement was attenuated by the students' majors: English majors showed the most change in support of the course and instruction, followed by fine arts, Spanish, industrial arts, music education, and finally, physical education majors. Later, in 1991, using a case study approach,

Hollingsworth and Teel evaluated two science PSTs' beliefs towards reading and writing. The findings found that the PSTs were supportive of integrating these practices in future science classrooms. Similarly, within the realm of mathematics, Wilburne and Napoli (2008) determined that by the end of a combined language arts and math methods class, participants believed connecting literature and mathematics was effective. In summary, results of improved attitudes have been found across content areas and over decades.

Donahue (2000), Sulentic-Dowell, Beal, and Capraro (2006), and Daisey (2009) investigated PSTs own literacy practices and attitudes (e.g., leisure reading) in addition to their beliefs about teaching. Donahue found that students, within a content-area literacy course, reported greater appreciation for reading and deeper understanding about reading engagement for future students. Similarly, Sulentic-Dowell et al.'s future math teachers reported not being active or frequent readers in general, but acknowledged the importance of reading for teaching mathematical word problems. Daisey (2009) also discovered that the content-area courses helped PSTs become more open to the general view that reading can be enjoyable, rather than negative. In summary, PSTs may hold negative views about reading, but content-area literacy classes can have positive impact on attitudes about personal literacy practices as well as future teaching beliefs.

In more recent work, Freedman and Carver (2007) and Warren-Kring and Routledge (2011) developed and evaluated innovative teaching approaches for content-area literacy. Specifically, Freedman and Carver aimed to evaluate PSTs' beliefs and perceptions throughout an intensive summer course designed to emphasize how "literacy

development and the reading processes actually work” (p. 654). Data analysis was qualitative deriving from a collection of field-based reflective essays, assessments, logs, and class assignments. The assignments demanded students to make explicit connections between literacy strategies; content-area learning and literacy development. Results indicated that students developed a greater understanding of practices, theory, and attitudes toward implementing reading strategies following tutoring experiences and instruction. Warren-Kring and Routledge focused on transference of content-area literacy by incorporating a one-on-one tutoring component between PST and adolescent students. The study reported both comprehension improvement in the tutees and improvement in attitude and comfort level towards content-area literacy strategies for the PSTs. In summary, more recent research has aimed to coordinate knowledge growth and attitude change in concert through more rigorous course experiences yielding positive results.

It is critical to note limitations in many of these studies, regarding transfer to the classroom. The rationale for improving attitude is that PSTs, who have positive and rewarding experiences as readers, will then implement literacy practice in their classrooms and convey the positive notion of reading (Daisey, 2009; Nourie & Lenski, 1998; Sulentic-Dowell et al., 2006). However, this link cannot be assumed without direct empirical evidence.

Literacy instruction, research, and math. Content-area literacy research for PSTs has provided only minimal attention on mathematics, relative to science and social studies. In 1997, Reinke, Mokhtari, and Willner reported that PSTs have little

knowledge about the interdisciplinary teaching and learning in connection with mathematics instruction in particular. Almost a decade later, Sulentic-Dowell et al. (2006) reiterated the disconnect between content-area literacy and math. In order to explore this gap, Reinke and colleagues examined the perceptions of 123 elementary education PSTs who taught all subjects, including math. Results from the instruments indicated positive change in perceptions, for the integration of teaching mathematics, writing, and reading in the classroom and for improving reading skills for a better understanding of mathematics. PSTs reported that instruction of mathematics and language arts are easily combined and when writing is used in mathematics instruction, this combination is helpful for learning problem solving skills. Lastly, positive perceptions were evident when integrating reading and math methods courses. Hence, the results (although limited) begin to address concerns of previous research and provide support for greater integration of mathematics, and literacy, as well as more research in this area.

Findings from Research on Knowledge and Reflection

In this section, nine studies analyzed PST knowledge and reflection (critical and metareflective), representing 28% of the inclusive studies. These studies are summarized within Table 3.5. All were recently published (within the past decade), and continue to measure the need for secondary PSTs to teach using multiple approaches and strategies (i.e., concept maps, journals, metareflections, and literature circles). For representative examples, both Donahue (2003) and Pytash (2012) used writing as a method to develop their students' knowledge and literacy practices unique to teaching in their content-areas.

Along with multiple approaches, researchers Lesley (2004), Alger (2007), and Lesley, Watson, and Elliot (2007) prompted PSTs' metacognition in the context of their content-area classes and aimed for PSTs to comprehend texts with a broad and questioning stance. Specifically, Lesley (2004) probed content-area literacy from a critical literacy lens, teaching students to provide voice about oppressive experiences with the use of reading and writing pedagogy. Whereas, from a global perspective, Alger (2007) states the "purpose of the curriculum is to move student teachers' thinking beyond their content-area to consider that the literacy of their students is an issue of social justice" (p. 620). In her study, Alger introduced themed literature circle pedagogy into her content-area literacy course. Lesley and colleagues (2007) examined PSTs metacognition to develop as teachers and improve their own reading skills.

Unfortunately, researchers discovered that the majority of the text connections (Tovani, 2004) made by PSTs were text-to-self connections, which are considered the lowest levels of connection types (e.g., text-to-text and text-to-world; Keene & Zimmerman, 1997). PSTs made minimal text-to-world connections and no text-to-text connections related to the instruction of the class. Therefore, although, content-area classes teach the importance of critical reading (Lesley et al., 2007; Tovani, 2004), and self-monitoring through the reading process, these practices were limited in use for PSTs.

Recently, from an alternative perspective, Olson and Truxaw (2009) began with the "assumption that preservice teachers' success in and commitment to their disciplines also makes it difficult for them to see how literacy practices are central to the learning of content" (p. 423). It is commonly assumed that secondary majors are experts within their

specific content, but their preparation and roles as literacy educators is lacking. Science and mathematics PSTs participated in a semester-long methods course with a practicum component, which emphasized literacy practices and new literacies through interactions with the students, Olson and Truxaw (2009) discovered the PSTs generated “new insights and questions” (p. 429). Participants were able to make the connection that the reading practices are already present in the instruction and helped the PSTs progress “toward an emergent understanding of literacy practices in the content” (p. 429).

As teachers contend with the advantages and challenges of teaching in the 21st century (Alvermann, Friese, Beckmann, & Rezak 2011a; Alvermann, Rezak, Mallozzi, Boatright, & Jackson, 2011b), they must work within the confines of realistic classrooms with struggling readers, multiple worldviews, and the experiences (or lack thereof) students bring with them to school. Fundamentally, students can be empowered as learners and thinkers through the effective use of content-area strategies. Therefore, it is an appropriate pairing for content-area instruction to grapple with larger worldview issues of critical literacy, social justice, and access to information.

Table 3.5 Summaries of Studies—Knowledge and Reflection

<u>Study</u> <i>Author(s), year- alphabetical</i>	<u>Population</u> <i>& # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</i>	<u>Research</u> <u>Method & Data</u> <i>Source: Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u> <i>Beliefs Experience Knowledge Practices Implications Instructional methods Multiple Metacognition Strategies</i>	<u>Study Findings</u>
Alger, C. L. (2007)	PST N=18 (13 F) (5 M) Content area methods course	QUAL Final reflection, a question on the final exam, learning log, course reflection	Broad themes, coded into categories, categorical coding and thematic analysis	Knowledge Strategies	Emerging themes—content learned and commitment. 16 of the 18 participants stated a direct connection between literacy and sociopolitical power. Eleven of 18 expressed new knowledge of literacy and social justice is an important concept learned through the course and that their learning was affected through the experience.
Alvermann, D., Friese, E., Beckmann, S., & Rezak, T. A. (2011a)	N=2 prospective math teachers were paired with (N=2) middle school teachers. PST & INST	Emails between participants and researchers, the course syllabus, instructional texts, lesson planning, lesson plans, professor's feedback, semi- structured interviews	Case study, Bourdieu's cultural capital (both institutional and embodied), field, and misrecognition were selected as analytic tools.	Practice Knowledge Understanding Professional development (online)	Results indicated that despite the focus of the study on domain knowledge through pedagogical mentoring, knowledge was effectively integrated with varied reading instruction. While reading teacher educators support practicing math teachers in content area instruction, there is a direct need for other sources of math.
Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b)	N= 1 PST in science and math secondary concentratio n.	QUAL Intervention lesson plans, emails containing reflections	Interpretive case study, discourse analysis, coding, inductive and deductive content analyses	Reflective practice Online learning	The study evaluated a PST's struggle with an online literacy course and how she made sense of the instruction and her abilities to use skills-based instruction. The PST produced a concept map that depicted the relation between science concepts and the specific vocabulary terms. By providing students with opportunities for approximations in online courses, this can be useful for the student(s).
Dowdy, J. K. & Campbell, D. (2008)	N=11 teachers (11 M) (science, social studies, physical education, and art) PST & INST	QUAL Case study Triangulation, prolonged engagement, peer debriefing, member checks, and thick description. Transcripts, audiotaped interviews, reflections	Constant comparison, Inductive categories and questions emerging from the data	Knowledge Reflective Enhance reading and writing instruction	Three themes emerged from the questioning: what was learned in the arts-based class, examples of what is used, and the rationale behind using arts-based educational instruction in content-area classes. The teachers involved gained knowledge and information about teaching diverse students. The teachers provided evidence of growth of teachers and leaders who value the arts.

Table 3.5 Continued

<u>Study</u> <i>Author(s), year- alphabetical</i>	<u>Population</u> <i>& # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</i>	<u>Research</u> <u>Method & Data</u> <i>Source: Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u> <i>Beliefs Experience Knowledge Practices Implications Instructional methods Multiple Metacognition Strategies</i>	<u>Study Findings</u>
Lesley, M. (2004)	PST N=25 (15 M) (10 F) (24 C) (1 AA) Postbac students Content area methods course	QUAL Teacher researcher Field notes, reflective journal, and an archive of student writing, transcriptions of key discussions, analysis of student questions.	Constant comparative of field notes, analysis of vignettes, and periodic member checking, cross comparative analysis of data sets.	Beliefs Instructional methods	Certification students gained knowledge and perspective about the use and need of content area literacy instruction. Through critical questions, exploring diverse perspective, and facilitating discussions, participants viewed literacy as a tool for advocacy.
Lesley, M. Watson, P., & Elliot, S. (2007)	PST N= 47 Content area methods course	QUAL Classroom observations, field notes, student and researcher debriefing sessions, follow- up focus group, reader-response writing	Inductive analysis with categorical coding with typology of cognitive strategies (Keene & Zimmerman (1997)	Attitudes Beliefs Metacognition	Students relied primarily on text- to-self connection, rather than both text-to-world and text-to- text. And negatively rooted attitudes toward reading, thus the students primarily relied on nonproficient reading strategies.
Olson, M. R. & Truxaw, M. P. (2009)	PST N=24 Science and mathematics teaching methods course	QUAL Field notes and recorded students, analysis paper. Researcher reflective notes and written memos	Patterns and inductive analysis	Knowledge Practices	Teachers need to understand literacy practices of the content area, but also the needs and literacy practices of the students.
Pytash, K. E. (2012)	N=41 (9 art) (1 business) (2 dance) (2 health) (3 music) (2 physical education) (11 science) (12 social studies) Content area methods course	QUAL Open-ended questionnaires, correspondences, unit of study projects, written reflections, focus group interviews	Constant comparative analysis	Experience Practice	Through engaging opportunities, PSTs' perceptions of how to teach writing changed. Originally, writing was not part of the teaching process of a content class, by the end, the method and approach is purposeful in content instruction.

Findings from Instructional Practices and Pedagogy

In this section, nine studies analyzed PST instructional practices, representing 28% of the inclusive studies. These studies are summarized within Table 3.6. The majority of the studies were published within the last five years, with one study published in the late 1990s.

According to Cox et al. (1998), teacher education has perpetually been center stage in the United States and, accordingly, a substantial amount of research has been conducted on teacher education curriculum, teacher preparation, and teacher knowledge. A critical aspect of teacher knowledge is pedagogical content knowledge, which is how knowledge is transferred from the teacher to the students and includes strategies and instructional practices (Shulman 1986; 1987). The following subset of articles focuses on aspects of teacher knowledge and transfer of knowledge, although these concepts were taught and measured in a variety of formats: concept mapping, tutoring implementation, and learning logs.

As previous research focuses on the preservice and inservice teachers' knowledge (e.g., Bos, Mather, Dickson, Podhajski, & Chard, 2001; Joshi et al., 2009; Moats, 1994), Cox and colleagues (1998) in a sophisticated research, randomly assigned 33 PSTs to two literacy blocks (e.g., classes in different locations, one located at an elementary school site and the other class held on the university campus with a practicum component). Eighteen PSTs took part in a class based in an off-campus elementary school and the other 15 participants were instructed on the university campus with a related practicum. An innovative technique utilized by the research team was

concept mapping (Novak, 1990) to organize and evaluate the learning process. For the purpose of this study, the researchers utilized concept maps as a form of instruction, conceptualization, and a means to reveal misconceptions (Cox et al., 1998). The participants initially generated a concept map responding to a specific question and the process was then repeated at the end of the semester. Results indicated students from the school-based class developed concept maps that contained more detail, and were more professional and cohesive. From the analysis, the researchers suggested that school-based instruction provided the PSTs with a greater understanding of literacy teaching and the subject matter, as well as provided more breadth to their ideas and the concept maps.

Other methods of instruction evaluated teacher preparation through tutoring experiences (Conley, Kerner, & Reynolds, 2005; Cox et al., 1998; Daisey, 2012; Feret & Smith, 2010; Nokes, 2010), and field-based practices (Daisey, 2012, Feret & Smith, 2010; Nokes, 2010). Four of the five studies used established methods courses with an emphasis on literacy instruction and Nokes' (2010) action research study, conducted over six consecutive semesters implemented content-area literacy instruction in his Methods of Teaching Social Studies course, with the support of the university content-area literacy specialist.

Although each of the studies approached the process from a different instructional practice and pedagogy, they all showed positive growth for the PSTs in terms of gaining experience, constructing richer knowledge, and gaining new and deeper knowledge of content instruction, literacy, skills, and pedagogy. All researchers reported

positive influences and knowledge construction for the PSTs; whereas, Conley et al. (2005) cautioned future researchers when conducting tutoring of field-based work in classrooms (i.e., urban) to be aware of the “need to know” (p. 30), in regards to the school environment, students, parents, teachers, and community in general.

In another recent action research study, Sheridan-Thomas (2007) drew data from class assignments (written, online discussion forums, reflective learning logs, and a paper on multiple literacies). With the focus of her content-area literacy course geared toward multiple literacies, Sheridan-Thomas also used the action research and design to enhance her teaching pedagogies. As reported, the PSTs developed a new lens and the topic reinforced the need for engaging students in such discourse, while helping PSTs make explicit connections with content-area literacy less design.

In summary, this subset of articles focusing on aspects of teacher knowledge and transfer of knowledge reveals that PSTs with varied experiences of instruction (e.g. concept mapping, tutoring implementation, and learning logs) demonstrate positive gains in their knowledge of instructional practices and content instruction.

Table 3.6 Summaries of Studies—Instructional Practices and Pedagogy

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Experience Knowledge Practices Implications Instructional methods Strategies</u>	<u>Study Findings</u>
Conley, M. W., Kerner, M., & Reynolds, J. M. (2005).	PST N=125 junior-level teacher candidates Content area methods course	QUAL Threaded discussions and printed as transcripts.	Ethnographic procedures: Componential analysis and taxonomic analysis	Knowledge Practice	PSTs gained increased understanding of the role as future teachers; it is a form of entertainment, and concern of working directly with a student or student(s). They gained a more complex view of teaching, classroom management, experimenting with different teaching styles, and build upon student's knowledge and background.
Cox, B. E., Fang, Z., Carriveau, R., Dillion, D., Hopkins, & Nierstheimer, S. (1998)	PST N=33 Literacy block course	MIXED Quasi- experimental, Pre and posttest course scores of concept map	Analysis of concept map, covariance, comparative analysis, compare and evaluate	Knowledge	Two groups of participants (Earhart and Mapleton). The Earhart students had a statistically significant greater level of understanding and suggested that their experiences helped the PSTs identify appropriately with their maps and the pedagogical and content ideas. The group with the school- based students constructed richer and more professional concept maps.
Daisey, P. (2012)	N=67 (37 F, 30 M), (63 C, 2 A, 2 AA) (17 social studies) (16 mathematics) (11 English) (4 Spanish) (4 integrated science) (3 art) (2 business/ marketing) (2 communication arts) (2 Chinese) (1 chemistry) (1 computer science) (1 automobile technology) (1 biology) (1 Japanese) Content area literacy course, 30-hour field experience	MIXED Quasi- experimental Post semester survey, likert questions and open-ended questions	Paired <i>t</i> -tests and Spearman correlations, constant comparative analysis	Beliefs Experience	PSTs' perceptions positively changed regarding tradebooks, biographies, and before, during, and after lessons. They also expressed increased enthusiasm for their integration of future reading instruction. Field experiences can be beneficial for both inservice and preservice teachers.

Table 3.6 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Experience Knowledge Practices Implications Instructional methods Strategies</u>	<u>Study Findings</u>
Donahue, D. (2003)	PST N=4 (4 F) Content area methods course	QUAL Reading logs	Inductive coding: themes	Metacognition	Math and English- language arts PSTs indicated increased knowledge of reading across disciplines. Recognized that knowledge of reading (strategies/journaling) contributed to the process of making meaning from texts.
Feret, A. J., & Smith, J. J. (2010)	PST N=8 (8 F) (2 M)	QUAL Reflective summaries and quotations.	Analytic induction and denote contrasts in patterns and categories	Knowledge	Indicated that PSTs gained new knowledge about themselves as a practioner and their students during the course and placement. Through experience and lessons, the PSTs realized that by incorporating literacy instruction, it enhanced creativity, the quality of the projects, and developed critical thinking.
Lesley, M. Watson, P., & Elliot, S. (2007)	PST N= 47 Content area methods course	QUAL Classroom observations, field notes, debriefing sessions, follow- up focus group, reader-response writing	Typology of cognitive strategies (Keene & Zimmerman (1997)	Attitudes Beliefs Metacognition	Students relied primarily on text-to-self connection, rather than both text-to- world and text-to-text. And negatively rooted attitudes toward reading, thus the students primarily relied on nonproficient reading strategies.
Nokes, J. D. (2010)	PST N=119 (87 F) (32 M) Methods of teaching social studies course(s)	QUAL Open-ended responses, exams, papers written during candidates practicum experience	Practice-based research; reading reflection coding, categorical analysis	Effectiveness Knowledge	Participants recognize the need to change traditional literacy practices (e.g. textbook) to including documents, fictions, and nonprint texts. PSTs identify the role of literacy instruction to provide support for content classes.

Table 3.6 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting: Inservice (IST), Preservice (PST) Or BOTH</u>	<u>Research Method & Data Source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus: Attitudes Beliefs Experience Knowledge Practices Implications Instructional methods Strategies</u>	<u>Study Findings</u>
Sheridan-Thomas, H. K. (2007)	PST N=64 graduate level Content area methods course	QUAL Written work: online discussion forums, reflective learning logs, paper for the required course.	Analyzed inductively, using categories and patterns. Categorical analysis	Application Knowledge	PSTs constructed knowledge of multiple literacies and applied understanding to lesson planning. The course and instruction provided a new lens, developing a broader spectrum of literacies, reinforced the usefulness of engaging in multiple literacy discussions.
Sullentic-Dowell, M. M., Beal, G. D., & Capraro, R. M. (2006)	PST N=129 (123 F, 6 M) (113 C, 16 AA) Three literacy courses: Lit I: theoretical foundations, Lit II: Pedagogical practices, Lit III: Assessment	QUAL Estes Attitude Scale, questionnaires, interviews,	Constant comparative analysis	Attitudes Beliefs Experiences Strategies	The level of active reading for PSTs can impact instruction. PSTs do not dedicate time to reading, but are capable readers. They claim reading as important and have a positive reading attitude, their habits did not reflect in their teaching.

Research Findings

In this section, I will synthesize the findings from the research presented in this review. Specifically, covering the themes and categories that emerged from the research, which include: PSTs' beliefs and attitude, knowledge and reflection, and instructional practices and pedagogy, in the context of content-area literacy instruction. An inclusive table of all the studies and characteristics are summarized with in Appendix A.

First, all of the inclusive studies evaluated content-area literacy instruction for PST preparation with an additional five studies that evaluated and combined preservice and inservice teachers. A secondary focus, the majority of studies investigated teacher

preparation with the instructional focus (i.e., strategies) and the implementation within content-area literacy (Bean, 1997; Conley et al., 2005; Daisey, 2009; Daisey, 2012; Donahue, 2000; Donahue, 2003; Feret & Smith, 2010; Fritz, Cooner, & Stevenson, 2009; Hollingsworth & Teel, 1991; Konopak et al., 1994; Nokes, 2010; Olson & Truxaw, 2009; Reinke et al., 1997; Warren-Kring & Rutledge, 2011; Welle, 1981; Wilburne & Napoli, 2008). Whereas, other studies focused on PSTs' misconceptions of content-area literacy, more specifically resistance (e.g., Nourie & Lenski, 1998; O'Brien & Stewart, 1990; Stewart, 1990; Stewart & O'Brien, 1989) to utilizing class time to implement literacy strategies along with class content.

As the themes and categories emerged, it was essential to recognize the sum of studies that examined and reported change in PSTs' beliefs and attitudes toward content-area literacy (Akerson & Flanigan, 2000; Bean, 1997; Daisey, 2009; Daisey, 2012; Donahue, 2000; Freedman & Carver, 2007; Fritz et al., 2009; Hollingsworth & Teel, 1991; Konopak et al., 1994; Lesley et al., 2007; Nourie & Lenski, 1998; O'Brien & Stewart, 1990; Reinke et al., 1997; Stewart, 1990; Stewart & O'Brien, 1989; Sullentic-Dowell et al., 2006; Warren-Kring & Rutledge, 2011; Welle 1981; Wilburne & Napoli, 2008) in either their preparation and methods courses, through practical application (e.g., tutoring), or pedagogical teaching practices. Similar to the work conducted by Risko and scholars (2008), convergent evidence supported a predominantly positive finding that PSTs' beliefs and knowledge are strongly impacted by instruction and the context of methods courses which emphasize content-area literacy. Findings also indicate that maintaining these constructs (e.g., the intention of applying content literacy strategies)

may be problematic during student teaching or in their teaching placement, due to limited support for providing time to use such strategies (Bean, 1997; Curwen, Miller, White-Smith, & Calfee, 2010; Hollingsworth & Teel, 1991; Stewart, 1990; Stewart & O'Brien, 1989). Many studies reported positive change in PSTs' beliefs and attitudes; although, typically the interventions were short-term, only one or two semesters in length. These limitations align with findings of Risko and colleagues (2008) and raise the question about the optimum length of the course instruction, as well as research interventions. Furthermore, the need for independent evaluations and replication studies was made apparent.

The second category of knowledge and reflection impacts PST preparation through gaining a deeper understanding of how and when PSTs use literacy strategies within content-area literacy instruction. Two studies (Donahue, 2000; Lesley, 2005) placed the PSTs in real-world teaching situations to develop a better understanding of how they gained knowledge through pedagogy. Although the PSTs' beliefs were positive toward reading instruction and transferring the need of the instructional practice to the classroom, PSTs need just that—the opportunity and ongoing training to stay current with teaching pedagogies and personal learning experiences (Donahue, 2003).

Several studies examined the effects of using writing strategies about the learning experiences such as journals and reflections (Donahue, 2000; Pytash, 2012), concept mapping (Alvermann, 2011b; Cox et al., 1989), and lesson planning (Alvermann et al., 2011b; Konopak et al., 1994; Sheridan-Thomas, 2007). These strategies helped the PSTs

to broaden their scope of knowledge as well as develop their metacognition toward regarding literacy integration.

As supported by the Carnegie Foundation *Writing Next* report, Graham and Perin (2007) identified, writing instruction is an effective method for helping learners gain proficiency in writing; this gives PSTs opportunities to analyze, read, and emulate models of good writing (Pytash, 2012). In addition, high-quality writing instruction provides opportunities for authentic writing purposes and can be delivered in a variety of ways (Graham & Perin, 2007; Pytash, 2012). According to Pytash (2012) if the goal of teacher educators is for PSTs to teach disciplinary literacy instruction, then they, in turn, need opportunities to engage in reading and writing; this increased practice in disciplinary literacy promotes pedagogical and metacognitive knowledge.

The last category, as previously mentioned, was used to describe and explain studies that examined PSTs' instructional practices and pedagogy. Although similar to knowledge and reflection, these studies focused on the specifics of instructional practice and connected "knowledge, teaching, and beliefs while implementing instruction at enhancing all three" (Risko et al., 2008, p. 267). By placing PSTs in tutoring or field experiences (Conley et al., 2005; Cox et al., 1998; Daisey, 2012; Feret & Smith, 2010, Nokes, 2010), PSTs grew from the learning opportunity—to learn from doing as a teacher, but also from learning to be a role model for reading (Daisey, 2012). Results suggest that by embedding content-area instruction with the practical application of a field-based class or tutoring, it yields positive results with participants (Nokes, 2010) while providing the PSTs with experiences to gain new knowledge about both

themselves and their students (Feret & Smith, 2010). Bridging the gap between intention and practical implementation of content-area literacy strategies, such supported practical experiences may provide a necessary (but often overlooked) stage of scaffolding. During the instruction, scaffolding provides additional support to the student during the learning process (Sawyer, 2006) an interaction of moving from collaborative to independent learning (Wood, Bruner, & Ross, 1976), or the zone of proximal development (ZPD) is “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

Related Findings within the Research

The primary, underlying challenges addressed by this review are to understand how to teach future students to read and write effectively with 21st century literacy skills in multiple disciplines. The secondary, more specific, issues are: preparing PSTs for a future in the classroom, helping inservice teachers stay motivated and knowledgeable of effective techniques, and creating effective content-area literacy and disciplinary literacy strategies.

The four decades of research reviewed in this analysis has focused on PSTs’ preparation for content-area literacy instruction, with a particular emphasis on understanding their beliefs, knowledge, and training experiences for teaching literacy instruction in the content-specific classes. Because of this focus, this review separates itself from previously published reviews, which focused on overall reading preparation

for teachers (Risko et al., 2008), content-area teachers' attitudes and practices toward reading in the content-areas (Gillespie & Rasinski, 1989), and preservice and inservice middle and high school content-area teachers' beliefs and attitudes regarding teaching reading in the content-area (Hall, 2005).

Most closely aligned to this review is Hall's (2005) review, where she presented findings of both PST and INST content-area teachers' beliefs and attitudes about teaching reading within the context of a content-area class. Hall determined that it is a difficult task to promote change in INSTs' beliefs regarding content-area literacy, which leads one to conclude that content area literacy preparation at the PST level may be most beneficial.

Hall (2005), Risko (2008), and the current study all deconstructed findings into similar themes. In her review, Hall identified a range of beliefs: (a) content-area teachers' ability or inability to teach reading, (b) teaching responsibility, (c) the importance of teaching reading in content-area classes, and (d) PSTs' willingness, but lack of knowledge to teach reading. In contrast, Risko and her colleagues (2008) more generally assessed the literature regarding perspectives to the resistance and change of PSTs' beliefs about reading instruction and the theoretical orientations of research. Likewise, this specific review also focused on resistance to change and beliefs in response to PSTs' literacy instruction.

With regard to beliefs and attitudes, similarly to the Hall (2005) and Risko and colleagues' (2008) reviews, this present study also made several connections among the research. First, a vast number of PSTs believe their future students will not require

reading instruction and they are operating on an assumption of teaching students with high levels of literacy. Donahue (2000) reported that the PSTs in his study would not necessarily focus on reading and writing instruction in their science classes. While similar beliefs arose with PSTs from the studies of Stewart and O'Brien (1989), and Stewart (1990), some PSTs recognized the benefits of content-area literacy; many perceived it as an intruder (Stewart, 1990) and difficult for students due to their lack of prior knowledge (O'Brien & Stewart, 1990).

Critique of the Research

The primary focus of this systematic literature review was on the research addressing PST preparation for content-area literacy instruction (e.g., English-language arts, mathematics, science, social studies, foreign languages, and technical and arts-based instruction). Because of the specific focus on content-area literacy of this review, it differentiates itself from the previously mentioned reviews evaluating content-area literacy instruction. Critically different from the research presented by Hall (2005), this review evaluated the methodological quality of the research. By implementing the MQQ, I was able to provide a different perspective to the research. This difference, supports not only the need for research addressing content-area literacy and PSTs, but also research that meets higher standards of research established by educational research and peer-reviewed journals. The trends evaluated through the studies included in the review that met the MQQ standards, is that they address all aspects of research (e.g., research questions, theory, methods, reliability, validity, participants, and consistent findings). Although, there were discrepancies within the studies, they all met the criteria standards.

In contrast to the research of Risko et al. (2008) this review provided a more thorough analysis of the research, making comparisons between the findings and practices. First, this was made possible by re-evaluating the instrument and addressing issues of instrumentation reliability. Next, as a systematic review, this research aimed to analyze findings in a manner that translate directly to teacher preparation. In the next section, I evaluate, critique, and evaluate the design methods employed by this review. In addition, I address implications for practice and research.

A Content Focus

During the eight years between Herber's 1970 publication of *Teaching Reading in Content Areas* and the release of the second edition in 1978, interest pertaining to content reading instruction increased. During the same time period the seminal work of Durkin and her colleagues (1978-1979) on reading comprehension instruction concluded that little attention was devoted to guiding the actual reading conducted during class instruction. Despite Durkin and colleagues' recommendations, practical changes were not systemic about incorporating high levels of comprehension instruction into classrooms and, at the same time, literacy expectations have increased. Therefore, although reading comprehension and content-area literacy has historical precedence, due to increasing societal demands, technological advancements, and the lack of proficiency skills of children and adolescent readers—research continues to work toward meeting the evolving and dynamic reading demands of the future (Moore, Readence, & Rickelman, 1983).

As this review examined the research of 32 studies from the past 40 years, there were hundreds of other studies that also provided research-based evidence and assessment of content-area literacy and PST preparation. With regard to the parameters of the methodological quality, only a subset was included. These reviewed studies still provided a broad perspective of content-area literacy instruction, PST training and preparation—including beliefs and attitudes, knowledge, and pedagogical practices for implementing content-area literacy and reading strategies into the content classes. To ensure the quality of this review, the research employed several steps, including the use of multiple raters. With the guidance of previously published reviews (e.g., Hall, 2005 and Risko et al., 2008), the researcher was able to draw upon parallels, differences, and trends within the research.

The current review has several included studies that overlap with related reviews (e.g., Hall, 2005 and Risko et al., 2008). Three of the studies were included in the Hall (2005) review and four studies were found in Risko et al. (2008), and one study (O'Brien & Stewart, 1990) that appeared in all three reviews. Table 3.7 provides a visual representation of the overlapping research from the three reviews. The differences between the three reviews demonstrate that although research has similar topics and research agendas, the methods of investigation and review procedures can produce different outcomes. Additionally, each of the reviews have interrelated findings in relation to PSTs' beliefs regarding teaching reading, specifically in content-area instruction (Bean, 1997; Donahue, 2000; O'Brien & Stewart, 1990; Welle, 1981), and

enhanced pedagogical knowledge through the instructional practices of academic classes and the use of structured teaching with practical application (Risko et al.).

Table 3.7 Overlapping Reviews—Preservice Teachers

Study	Reviews		
	Scott, 2013	Risko et al., 2008	Hall, 2005
Bean, T. W. (1997).	X	X	
Donahue, D. M. (2000).	X		X
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994).	X	X	
Nourie, B. L., & Lenski, S. D. (1998).	X	X	
O'Brien D. G., & Stewart, R. A. (1990).	X	X	X
Welle, D. (1981).	X		X

Quality Controls

This systematic review has similarly followed the protocols and design of the critical analysis of research by Risko and colleagues (2008). The majority of the studies included in this review were predominately qualitative in nature ($n=23$) with similar conditions to the study conducted by Risko and the research team, the research was conducted in the authors' teacher-preparation courses, utilizing samples of convenience, and conducted over the course of one or two semesters. Through a paradigmatic approach, themes and categories emerged from the data sources (e.g., writing logs and

journals, lesson plans, reflections, interviews, observations and field notes from the PSTs' experiences in the course work and classrooms).

After completing the multi-step processes for attaining the final pool of studies included in this review ($n=32$), there remained a high level of discrepancy between the amount of details provided in the studies (e.g. participants, data collection, procedures, analysis, and how themes and categories were retrieved from the reported findings; Risko et al., 2008). Evidence of this discrepancy is found in the research design of the inclusionary studies. Out of the 32 studies, only four were classified as quasi-experimental (e.g., Cox et al., 1998, Daisey, 2009, 2012; Warren-Kring & Rutledge, 2011). In each of these studies, although not true experimental with random assignments, the researchers used non-randomized participants, and treatment and control groups. These experimental studies provided quality research, which in turn, supports findings of observational studies that provide projective findings within research, classrooms, and instructional practices. The other 28 studies were non-experimental in nature and did not apply randomized participant selection. The remaining four quantitative studies implemented such methods as instrumentation (e.g., surveys or questionnaires) and the remaining 23 studies, although many noteworthy, did not employ randomized participant selection methods. The researcher, with the aid of a secondary rater, collected this data; while evaluating and categorizing each of the studies, the researcher also made note of the studies research designs. In order to provide a higher level of scrutiny to this review, the researcher and a secondary rater re-evaluated the research design of each of the 32 studies, and inter-rater reliability was set at 97% (31 out of 32 of the studies) overall

agreement. In the case of the one discrepancy, the raters resolved the difference and assigned the final research design with 100% agreement. Upon completion of the coding, it was established that in this review, there were no true-experimental studies, but four quasi-experimental studies with treatment and control groups.

Exemplary research. Although this review analyzed 32 different studies, one study in particular that should be acknowledged is that by Warren-Kring and Rutledge (2011). This quasi-experimental study conducted was notable in that it provided a more rigorous research design, and thereby ample details about the context of the study, the research procedures, and clear interpretations of the findings. While all studies included in this review met the criteria standards of the MQQ, studies such as this one went beyond the minimum standards in these areas.

In the research conducted by Warren-Kring and Rutledge (2011), the authors addressed two issues of concern: the call to align education courses with reading achievement, and the attitudes of teachers toward implementing literacy strategies into their content-area instruction. For 48 students, they were able to take the teaching and instruction from the course and apply it to a practical experience of one-on-one tutoring with adolescent students (i.e., middle- or high-school students). The study reported significant effects for both the adolescent tutees and also the PST tutors. The outcome and effects of the professional and practical training of the class when applied to tutoring, showed that significant changes occurred both with the tutees (in comprehension) and with the tutors (in attitudes and comfort levels of teaching with and using reading strategies).

Other well articulated studies were by Daisey (2009; 2012). This author conducted two quasi-experimental studies, and both employing a mixed-methods approach. As with much of the research on beliefs and attitudes, many researchers only provide one method (quantitative) of analysis—with the use of a survey or questionnaire. In contrast, Daisey assessed PSTs’ beliefs and attitudes, regarding reading and their participation in a required content-area literacy course, with multiple observations and points of analysis. Daisey also described the course conditions, methods for supporting the PSTs in the structure of the course, and reported sufficient findings from the collected data. While in her 2012 study, similarly, Daisey combined a 30-hour field-based experience and ample opportunities for practice through biographies, tradebooks, and a pre-, during, and post-reading lesson. The results indicated a positive correlation between the PSTs’ scores and participating teachers’ eagerness to implement what they learned in their future classes. Other notable studies provided adequate information; such as research questions and research methodology (Sheridan-Thomas, 2007), explicit participant information and selection (Cox et al., 1998; Sulentic-Dowell et al., 2006), and excellent descriptions of data analysis (Dowdy & Campbell, 2008).

Other Foci of Content-Area Literacy Instruction

Notably absent from the focus of the 32 articles, are discussions about the specific content (i.e., discipline) that the PSTs are being prepared to teach. Overall, 19 of the 32 studies addressed the instruction of literacy within courses teaching multiple content-areas of instruction (e.g., the four core areas—English-language arts, mathematics, science, and social studies) in addition to other content-areas (e.g., art, fine

arts, foreign language, music, physical education, vocational education). According to the studies in this review, the majority of the research focuses on PSTs with general content-area methods courses and the remaining 13 studies evaluated an interconnection of literacy and content-area instruction. Three studies addressed the content-areas of science and mathematics, two studies evaluated literature and mathematics, one study evaluated PSTs in a series of three methods courses (reading, mathematics, and reading and mathematics), and one study in each of the following disciplines or discipline combinations: science and English, art, social studies, science, and literature and art. This lack of information about the specific discipline is problematic because each discipline's literacy has unique needs and therefore corresponding teaching strategies. The lack of information in the research about content area can make generalizations to other teacher preparation programs difficult.

Implications

In the following sections, I will discuss the implications of this research with regard to literacy instruction and content-area instruction for PSTs.

Content-Area Class Instruction

Due to the nature of content-area research, minimal research has represented the “other” content-areas (e.g., arts, music, foreign languages). Currently, research often focuses on the four core disciplines (English, mathematics, science, and social studies) or situates **all** content-area instruction and secondary PSTs into one type of class or instruction (e.g., reading methods course for secondary majors). Within preparation, PSTs and teachers need opportunities to develop a cross-curricular foundation in literacy

instruction, while making literacy instruction applicable to their specific area of content instruction (Feret & Smith, 2010). For example, researchers Dowdy and Campbell (2008) and Feret and Smith (2010) conducted unique studies integrating literacy instruction in art or arts-based instruction with positive results. By critically applying literacy to an area of instruction, they provided students with opportunities to gain knowledge from text, make sense of the content, and engage directly with the curriculum.

The integration of literacy in relation to the specific content-area classes can provide teachers with instructional strategies better suited for the content curriculum and the academic language—and this is the fundamental argument of disciplinary literacy (Shanahan & Shanahan, 2008). Primarily, making this applicable to other content-areas, when teachers should be knowledgeable and know how literacy approaches are useful in classes are not normally literacy based (e.g., mathematics, drama, physical education).

Instructional Practices and Implementation Transfer

Research continues to evaluate and measure PSTs knowledge and uses of literacy strategies; however, a majority of the research is short-term and has limited follow-up with the participants. That is, the research does not inquire as to whether or not teachers continue to use literacy instruction in their instruction. In 1997, Bean conducted research that sought to understand PST selection of appropriate literacy practices. He contended that PSTs gravitate to one strategy that they felt was the most suitable for their particular discipline, rather than viewing the strategies as if they were listed on a “menu” and selecting the most appropriate strategy for the particular instructional task or text. A

semester later Bean conducted follow-up interviews with the study participants, and during this time he made the recommendation that a follow-up study would provide a better understanding of the PSTs selection and use of content literacy instruction.

Similarly, Hollingsworth and Teel (1991) monitored two students after the completion of their secondary reading course, and through their first two years of teaching secondary mathematics and science, respectively. Results indicated that both participants valued literacy instruction and held positive beliefs toward content-area literacy instruction. But, unfortunately, neither could justify utilizing class time for such strategies. Interestingly, one teacher stated his frustration with the project noting that the learned experiences from the PSTs course had little to no carryover into the real classroom (Hollingsworth & Teel, 1991).

Instructional theory. PSTs gain knowledge and information about what they should teach and how they should teach, but all too often, they are not knowledgeable as to why. Literacy instruction, particularly the applied strategies serve a purpose (e.g., summarizing, generating questions, text organization), and such purposes are supported by underlying cognitive processes. If teachers have a better understanding of the cognitive and theoretical underpinnings for the instructional strategies, they can apply this knowledge more flexibly and appropriately. Only having the operational knowledge of the strategy limits a teacher's use of the strategy. Knowledge of strategies and domains, when identified and applied by teachers, not only promotes learning for the students, but aids in curriculum development and instruction, as well as educational practices. Therefore, future research should consider depth of knowledge for PSTs.

New and multiple literacies. With the ever-changing demands of students and 21st century literacy skills, it is pertinent that PSTs are prepared for the current and future students in their classes, no matter the content-area or level of instruction. The technological advances in literacy instruction include, new, multiple, and digital literacies. However, multiple literacies are not limited to multiple and varied texts, rather the “multiplicity of cultural identities that are expressed through literacies” (Sheridan-Thomas, 2007, p. 122) are a method of distributing information. Multiple literacies incorporate methods of communication, media, and text, while new literacies inclusively use a variety of texts (e.g., audio, print, video, visual, and the Internet). Noteworthy, when teachers make real-world (e.g., pop cultural references, magazines, television) literacy connections, that are current, relevant, and relate to content-area learning, then students’ reading and writing interests and motivation improve (Hagood, Provost, Skinner, & Egelson, 2008). Therefore, as definitions of texts and literacy evolve with the 21st century, teacher preparation in this area must evolve accordingly.

Diverse populations. Briefly addressed in only one study, is the topic of diverse populations—relating to the demographics and make-up of the school, the school environment, the enrollment, the students, the teachers, the community, and the location. Information regarding diverse populations is highly relevant and can better prepare a PST for their teaching opportunities. With regard to literacy instruction, PSTs need to be knowledgeable of the school(s) in which they will be placed to volunteer or work. Having a “greater understanding of the context of the schools and communities will enable a more focused exploration of adolescent literacy so that more explicit

understandings of adolescent literacy and related practices can be promoted” (Conley et al., 2005, p. 31). As the population of U.S. schools becomes more diverse, it is essential that teacher preparation acknowledges and considers this reality.

Implications for Future Research

The past few decades, research concerning content-area literacy has been heavily inundated with PSTs’ beliefs and attitudes, including resistance to content-area literacy instruction. More recently the trend of recent has shifted to PSTs knowledge and theory (Alvermann et al., 2011a), educational practices (Pytash, 2012), field-based instruction and tutoring (Daisey, 2012; Warren-Kring & Rutledge, 2011), new and multiple-literacies (Sheridan-Thomas, 2007), and diverse classrooms (Conley et al., 2005). Although, these are current research topics, each one would benefit from further exploration because the resultant findings are not yet strong enough to have large impacts on instruction.

In terms of future research, it was observed through this study, that a minimal amount of research was devoted to experimental research design. Research in general, is important; however observational and survey studies are limited to the study and the research design with the non-experimental studies, they do not evaluate randomized participant selection.

Perhaps as researchers and teacher educators move forward, research should move beyond the basic research methodology of surveys and questionnaires and gain a better understanding of what PSTs need as well as the needs of instruction for their future teaching. This research would become more feasible by conducting, specifically,

more true experimental and quasi-experimental studies. Additionally, evaluating PSTs through qualitative data (e.g., case studies, open-ended interviews, and focus groups) and longitudinal studies for the preparation of the next generation of teachers—analyzing the lasting impact of content-area methods courses and the real transfer to the classroom and to instruction would surely benefit the field. Furthermore, future research should not only focus on one area of interest, but the universal needs of the future classroom including, teacher preparation, curriculum development, class and school design, the diversity of learners, and the demands of the technological advancement.

Conclusion

As the level of knowledge, experience, and understanding of reading comprehension and content-area literacy is multifaceted, PSTs are no doubt at different stages of development in their preparation for classroom instruction (Hall, 2005). Due to lack of prior knowledge and experiences (practical, tactical, hands-on, and theoretical), PSTs need in-depth training and scaffolding, in a manner that inservice teachers may not need. Therefore, evaluative synthesized research and studies, such as this review and the preceding research (Durkin, 1978-1979; Hall, 2005; Moore et al., 1983; Pearson, 1985; Risko et al., 2008) can inform the creation of future instructional experiences.

Through evidence-based research, this review has presented a large array of culminating research from the original number of 2,179 studies to the final 32 studies. As the researcher, I have worked to address the original research questions supporting this systematic review. First, the overarching question posed was: To what extent does the content-area literacy impact reading preserve teachers' instruction of reading

comprehension in content-area instruction? Due to the nature of this research, I am unable to answer this particular question. In order to explicitly answer this question, I would need to compare high and low quality content-area literacy instruction and this process was not conducted. Accordingly, the trends throughout the studies (Bean, 1997; Daisey, 2009; Daisey, 2012; Fritz et al., 2009; Pytash, 2012; Reinke et al., 1997; Warren-Kring & Rutledge, 2011; Welle, 1981; Wilburne & Napoli, 2008) indicate that PSTs have positive belief and attitude changes regarding teaching reading in the content-area from their coursework. Further, it must be noted that these findings are not always consistent (Akerson & Flanigan, 2000; Hollingsworth & Teel, 1991; Stewart, 1990) and may be due to PSTs own prior learning experiences, a lack of personal reading interest, or a stance that the content instruction take precedence. Not a single PST goes through their educational experiences in the same fashion; therefore, these unique learning opportunities may frame the perception and opinion of a PST prior to entering an education course. Hence, PSTs bring their prior experiences to their teaching. For example, teachers who enjoy and support reading, will likely promote reading or literacy instruction in the context of their class. Though some teachers with copious personal interest in reading may not see the urgency of promoting reading and literacy within class instruction. Therefore, similarities may be found between the teachers who do not promote reading opportunities, and those teachers who do not value the time within the instruction of the content-area class. In total, research which only focuses on PSTs' beliefs and attitudes, without addressing the link to instruction, is incomplete.

The second question addressed the methodological quality of content-area literacy research for preservice teacher preparation. This information is supported through the work of the researcher and inter-raters pertaining to the systematic process in which articles and studies were reviewed for this study. The original number of 2,179 encompassed research that included both preservice and inservice teachers. Since this review only addressed PSTs, the numbers in Figure 3.2 visually illustrate the findings presented in this analysis. Forty-two articles made it through the preliminary and secondary screenings, and were then assessed for methodological quality; the final 32 studies provided the body of literature included in this review. As previously mentioned, there were differences in the details provided in the research, but as assessed by the measurement, the studies were of high quality and provide academic support to reading comprehension, content-area literacy, and PST preparation.

For the studies that were not included in the review, there were several quality factors which these studies lacked. However, this information would lend itself to future research and provide literacy education with a deeper understanding to report on all the studies, rather than just those that meet the requirement of the MQQ. Whereas, the majority of the studies rejected for quality did not meet the reliability or validity criteria. These studies failed to provide information about the measurement or the data collection, or the instrument did not measure what it was designed to measure. While the studies may have measured reliability and validity, or used valid instruments, the reporting did not document such rigor. Additionally, three studies provided no explicit linkage from their findings to previous theory or research.

Lastly, the overall concentration of this review was to evaluate the primary themes and trends found within content-area literacy and PST research. There were three primary themes that presented themselves within the research: (a) evaluating PSTs' beliefs and attitudes toward content-area literacy—traditionally prior to their academic coursework and post-completion; (b) measuring PSTs' knowledge and reflection of content-area literacy; and (c) identifying the PSTs' instructional practices and pedagogy.

The first theme of PSTs' beliefs and attitudes toward content-area literacy was initially popular among research in the early 1970s and 1980s and then recently researchers have begun to evaluate this topic again. However, a difference in depth of research emerged. Many of the older studies utilized only questionnaires and surveys, not allowing researchers to gain a deeper understanding of the participants reasoning behind their beliefs of content-area literacy. Whereas, more recently, scholars have attempted to gain a better understanding of the participants' beliefs through the use of case studies, qualitative research, or mixed-methods approaches. Research has provided that PSTs traditionally are indifferent at the beginning of a reading methods course, but upon completion of the course instruction, they gain a newfound understanding of content-area literacy and make acknowledgements to attempt and use their new knowledge and create learning opportunities for their future students (Daisey, 2009). The findings of this review are consistent and the trends documented have evolved from decades of content-area literacy research. According to Moore and colleagues (1983) "in order to understand content-area literacy reading instruction, one needs to understand the larger context in which it emerged" (p. 421). From the early tradition of rote and

imitation learning, to memorization, students underwent a transformation from learning drills and skills to developing into readers.

Now, over a century later, content-area literacy still remains a topic of discussion and examination, literacy research and literacy educators need to move forward by addressing specific disciplines, texts, literacy strategies, and the instructional methods of delivery (Siebert & Draper, 2008) that enable students to develop into capable readers and writers. With a continued focus on literacy within content-areas, it is understandable that educational reform has no quick and immediate fix, but change and improvement need continued practical and theoretical applications (Zygouris-Coe, 2012). Hence, content-area literacy, reading comprehension, and PST preparation will continue to be an area of interest for research. The goal is to work toward finding the best practices for literacy instruction for all students, young, and old within the changing demands of literacy.

CHAPTER IV

INSERVICE TEACHERS' INSTRUCTIONAL PRACTICES, BELIEFS AND ATTITUDES, AND KNOWLEDGE: A SYSTEMATIC LITERATURE REVIEW

Introduction

Content-area literacy has a long, well-developed relationship with education (Adams & Pegg, 2012) and adolescent literacy (Biancarosa & Snow, 2004). Through a historic shift, content-area literacy has been perceived as covering two dimensions: student learning and the association between the content and literacy (Adams & Pegg, 2012). Therefore, content-area literacy and the quality of instruction are concerns for both researchers and teacher educators (Howe, Grierson, & Richmond, 1997).

The critical unease of teaching content-area literacy and students' reading abilities has led the charge for teaching reading to progress from the responsibility of the elementary level teacher to including effective reading programs and literacy instruction in the middle and secondary classrooms (Criscuolo, Vacca, & LaVorgna, 1980). Due to this shift in priorities, content-area literacy emphasis has increased (Biancarosa & Snow, 2004; Draper, 2002; Kamil, 2003) and reading instruction is infused within content specific classes (Moore, Readence, & Rickelman, 1983; O'Brien, Stewart, & Moje, 1995).

Since the early 1900s, the need for content-area literacy instruction has been recognized (Moore et al., 1983); despite this fact, it was not until the 1970s when teaching practices and teacher preparation were mandated and improved (Gee & Rakow,

1991; Moje, 1996) to include teacher preparation and literacy instruction. This improvement continued when state departments across the U.S. implemented reading course requirements for all middle and secondary majors in education programs (Bader, 1975; Moje, 1996).

Karlin (1969) purported that secondary teachers expressed their lack of knowledge and ability to teach reading instruction; they believe reading instruction is the responsibility of the elementary teachers. Due to increased numbers of students with poor reading skills, reading teachers and reading specialist became increasingly common positions in middle and secondary schools (Jackson, 1979; Lipton & Liss, 1978).

According to Park and Osborne (2006), content-area literacy is often rejected because content teachers perceive reading instruction as an additional teaching responsibility and irrelevant to their disciplinary content, not a process to gain content knowledge (O'Brien & Stewart, 1990). Still, content-area teachers who understand the need and implement literacy instruction carry the burden that they are ill-equipped to meet the students' literacy needs (Mallette, Henk, Waggoner, & DeLaney, 2005).

Despite decades of research regarding content-area literacy instruction and the beliefs of content area teachers, today's secondary schools and adolescent students continue to face a literacy crisis (Ness, 2008). A staggering 8.7 million fourth through twelfth grade U.S. students struggle to read the curriculum and textbooks (Kamil, 2003). More recently, compared to 2009 results, reading comprehension for grade 4 is unchanged, while grade 8 shows a one-point improvement (National Center for

Education Statistics, 2011). Therefore, continued research is necessary to rectifying the literacy crisis (Zygouris-Coe, 2012).

Previous Reviews of Content-Area Literacy Research

After an initial exhaustive and systematic search, several published literature reviews regarding content-area literacy, content-area instruction, and comprehension strategy instruction were identified (e.g., Gillespie & Rasinski, 1989; Lysynchuk, Pressley, d'Ailly, Smith, & Cake, 1989; Hall, 2005; Moje, 2007; Siebert & Draper, 2008). Although each review included components and characteristics of reading comprehension and content-area literacy instruction (e.g., content-area literacy and mathematics teachers, disciplinary literacy teaching, attitudes, beliefs and change, and attitudes and practices) they differ from the present review. In particular, the current review systematically identified and evaluated all peer-reviewed research from the past 43 years, addressing all characteristics of content-area literacy from kindergarten to post-secondary education, including all content-area classes (e.g., art, English-language arts, foreign languages, mathematics, science, social studies, reading instruction and teacher preparation). In the following section, the most relevant reviews will be highlighted to demonstrate the need for the present study and acknowledge the influences of previous studies. The reviews are presented in chronological order. Although these reviews provide strong evidence for content-area literacy instruction, only one review addressed the methodological quality of the relevant research.

Content-Area Teachers' Attitudes and Practices Toward Reading

First, Gillespie and Raninski (1989) explored the attitudes and practices of content-area teachers regarding reading in the content-areas. This review examined 16 studies pertaining to the attitudes content-area teachers, as well as the teachers' attitudes toward teaching reading in content-area classes. The Gillespie and Raninski study reported that reading instruction for content-area teachers proved to be beneficial for teacher attitudes and practices related to teaching reading. In summary, they concluded an increase in reading pedagogy could positively impact teacher attitudes and practices toward content-area reading instruction. Gillespie and Raninski reviewed studies that specifically addressed three categories related to content-area teachers: attitudes, attitudes and practices, and attitudes before and after completing a content-area course. Rather than focusing on one category of content-area literacy, this particular review evaluated all studies directly and indirectly related to PSTs and content-area literacy, including: beliefs and attitudes, knowledge, strategies, and implementation practices. Additionally, the authors did not apply any methods of research quality to their study.

Methodological Analysis of Comprehension Strategy Instruction

The same year, Lysynchuk et al. (1989) published a methodological analysis of experimental studies for comprehension strategy instruction. Although not directly analyzing content-area literacy instruction, Lysynchuk and colleagues evaluated 37 reading comprehension studies from 1977 to mid-1988, specifically focusing on both internal and external validity of the studies. The validity criteria included: general design; confounds-which incorporated materials, participant or subject information, and

treatment conditions; measurements, and statistics, referring to probability of Type I error and the appropriate statistical tests. From this research, the authors concluded that, in general, all the studies fell short in at least three areas of validity (not addressing long-term effects or transfer to instruction, delayed measures, or not assessing the transfer from newly learned strategies to instructional materials) and many were flawed experiments. In comparison, Lysynchuk et al. and I in this review, both conducted a form of methodological research quality. Whereas, Lysynchuk et al. narrowed their research specifically to reading comprehension strategy instruction, in contrast, I narrowed my research to content-area literacy utilized for this review.

Teachers and Content-Area Reading

Hall (2005) evaluated studies on preservice and inservice middle and high school content-area teachers' beliefs and attitudes regarding teaching reading in the content-area. She examined studies on preservice and inservice content-area teachers' motivation for teaching or opting not to teach reading in the content-area classes. Hall examined 19 studies published between 1970 and 2003 that focused on teaching content-area literacy in grades 6-12. According to her research, the majority of the preservice teachers displayed positive shifts in their attitudes toward teaching reading in the content-area classroom, which can be attributed to the required content reading courses. Hall (2005) concluded that although preservice and inservice teachers hold a range of beliefs regarding content-area literacy and their role as a teacher, their beliefs differed—whereas PST ground their knowledge in prior experiences and INST recognize they need to teach a variety of students and reading abilities. The positive attitudes of the teachers

do not always transfer from pre-service preparation into classroom instruction. Inservice teachers' attitudes regarding reading instruction showed positive outcomes only when the teachers were given ongoing support, saw the instruction as part of the curriculum, and were provided time to learn how to teach reading within the content.

In comparison to this systematic review; first, the focus of her research agenda was on the beliefs and attitudes of teaching content-area literacy in grades 6-12. Next, the scope of the search was limited to 1970-2003. The definitive difference is the narrowed research of teachers' beliefs and attitudes, whereas this research looked at all components relevant to content-area literacy and the included studies.

Developing Socially-Just Subject Matter Instruction

Moje (2007) conducted a literature review on disciplinary literacy teaching and focused on subject-matter instruction within secondary and postsecondary classes. Moje initially retrieved 1,037 articles, books, and edited volumes, many of which were not relevant. Therefore, Moje opted to highlight specific studies and to focus only on a small sample (although she did not provide the exact number of studies she analyzed), which extended to programs of research or studies that made a contribution to the field. She concluded, "young people need to have access to the conventions of disciplinary knowledge... [to provide]... young people [with] the power to read critically across various texts and various disciplines" (p. 37). Because of Moje's focus on the infusion of "socially just subject-matter instruction at the secondary and postsecondary level" (p. 1), there is minimal overlap between the two studies. However, the review in this dissertation has more implication and relevance regarding the field of teacher education

and content-area literacy. The review conducted by Moje has little to no impact on teacher preparation, whereas this review directly relates to current trends within the research.

Why Content-Area Literacy Messages do not Speak to Mathematics Teachers

Most recently, Siebert and Draper (2008) presented the findings of a critical analysis, which analyzed the literacy messages (“a collection of content-area literacy advocacy, policy, and methods texts” p. 231) of content-area literacy from mathematics educators’ perspectives. The analysis examined four types of literature: (a) texts, (b) literature consisting of position statements, (c) influential works on content-area literacy instruction, and (d) literature used as a tool to convey the importance of literacy instruction to content-area teachers. The authors concluded that from mathematics teachers’ perspectives, the literature commonly has negative connotations for mathematics instruction (Siebert & Draper). Therefore, mathematics teachers find implementing content-area literacy instruction irrelevant to their instruction and discipline.

The Collective Thoughts of Previous Research Reviews

The collective material from these reviews provides a wide array of research regarding reading and content-area instruction. These reviews focused on comprehension strategy instruction (Lysynchuk et al., 1989), preservice and inservice beliefs and attitudes (Hall, 2005; Gillespie & Raninski, 1989), discipline literacy instruction (Moje, 2007), and content-area teacher perspectives (Siebert & Draper, 2008).

With years of research and a myriad of publications in reading comprehension, present research in content-area literacy, and the instructional practices of preservice and inservice teachers, there is limited research for a cohesive study that examines multiple components of preservice and inservice teachers preparation in connection to content-area literacy. Current legislation, such as Common Core State Standards (CCSS), identifies a need for research-based practices to support students' content-area literacy skills and therefore teachers' preparation to teach such skills. However, is the current research supporting this need? For this systematic review, studies were examined the and methodological qualities of the studies were evaluated.

Contributions from Additional Content-Area Literacy Research

Consistent with previously presented literature reviews, much work in content-area literacy and reading comprehension in the content-area classes has been guided by recommendations based on research and reviews conducted by the National Reading Panel (NRP), the National Institute of Child Health and Human Development (NICHD), and the International Reading Association (IRA). While not focusing on content-area literacy, an NRP report subcomponent on text comprehension sought to identify general “reading comprehension strategies to guide and improve reading comprehension” (NICHD, 2000, p. 2). The findings emphasized a list of 16 strategies focused on cognitive processes important for monitoring comprehension (Willingham, 2006). Similarly, the 2007 NICHD report *What Content-Area Teachers Should Know about Adolescent Literacy*, although limited, was a research review addressing the need for improving the reading and writing skills of adolescent learners and provided

recommendations for instruction. Lastly, the *Adolescent Literacy* position statement endorsed by the IRA (updated in 2012) provides a thorough guide that offers support for adolescents' ongoing literacy and personal development.

Although the literature reviews and the national studies provide ample research in instructional practices for reading comprehension and adolescent literacy, they do not provide an extensive systemic review of the methods for *preparing teachers to implement* reading comprehension instruction and content-area literacy strategies in content instruction. Therefore, the need for a comprehensive search was deemed necessary.

Seminal Study

In 2008, Risko and colleagues published *A Critical Analysis of Research on Reading Teacher Education*. The analysis provided an extensive review of 82 empirical studies on teacher preparation for reading instruction conducted in the United States. The research conducted by Risko et al. has served as the foundational framework and the seminal study (concept and methodology) for the current systematic review.

Building upon the concept and format of the 2008 Risko et al. study, the purpose of this review was two-fold: (a) to synthesize content-area literacy instruction and strategies for the past 43 years, and (b) to evaluate the studies for the past 43 years in regards to their methodological criteria. This review assessed the strengths and weaknesses of the inclusionary and cumulative research, the intent was to be able to provide a knowledge base of research and offer insight into the past, present, and future of instruction and teacher knowledge of content-area literacy research.

Present Study

Purpose

Researchers in the field of literacy education have long supported the teaching of literacy strategies and practices in content classrooms (e.g., English-language arts, mathematics, science, social studies), which fosters student comprehension of content curricula (Durkin, 1978-1979; Herber, 1970; Readence, Bean, & Baldwin, 1998). With regard to ever-changing students and evolving technological trends, it is necessary to develop a better understanding for inservice teachers (INST) training for continued development of content-area literacy instruction. Therefore, the purpose of the current study was to make relevant connections between improving literacy instruction and content-area literacy.

In an attempt to link connections from the research to practice, this review evaluates a cumbersome amount of research related to content-area literacy. The review presents the research for over four decades, in addition to using a methodological quality instrument to present studies that are not only evaluating content-area literacy, but that also met the quality standards. Two previously published reviews were utilized as guides, but they were also used as a reference of how to make this research and argument stronger. Distinct differences were found between the previously published reviews (Hall, 2005 and Risko et al., 2008). This review focused on the following research questions:

- To what extent does content-area literacy education impact inservice teachers' instruction of reading comprehension in the content areas?

- What is the methodological quality of content-area literacy research for inservice teacher training and education?
- What are the primary themes and trends within content-area literacy research for inservice teachers?

Methods

This study employed the systematic review process (e.g., Hannes, Claes, & Belgian Campbell Group., 2007; Risko et al., 2008; Torgerson, 2007) to synthesize findings for the past four decades regarding the INSTs training and instruction of literacy practices in content-area courses. Specifically, the implementation of reading and writing practices for teaching math, reading/language arts, science, and/or social studies is described through the synthesis of empirical (e.g., studies that report original research; American Publication Association, 2010), peer-reviewed studies. The systematic review method involves four phases: (a) searching and identifying studies, (b) a multi-step screening process of identified studies according to a pre-determined set of inclusionary and exclusionary criteria, (c) the methodological analysis of the selected studies according to a pre-determined set of quality indicators, and (d) a descriptive synthesis of the selected studies in a qualitative overview of the findings (Torgerson, Porthouse, & Brooks, 2005).

Review Inclusion and Exclusion Criteria

To be included in this review, articles had to meet the following five inclusionary criteria: (1) published in English; (2) published in a peer-reviewed journal; (3) published

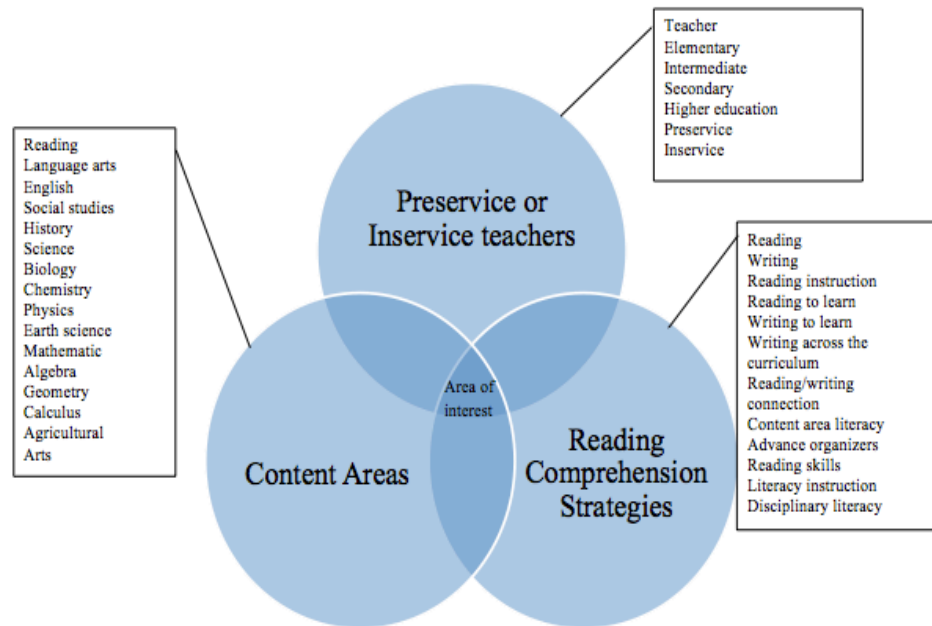
between the years of 1969-2012²; (4a) examined empirically the topic of reading comprehension for content-area instruction; (4b) study conducted and data collected in the United States; (5a) examined content-area literacy instruction; (5b) analyzed reading comprehension in content-area instruction; and (5c) analyzed the instructional practices of preservice and/or inservice teachers. Additionally, since the database search took place on June 11, 2012 and the manual Scopus search was concluded on December 27, 2012, articles published after this secondary date were not included in the review.

Search Methods and Keywords

The first process for acquiring the studies for this review was a comprehensive database search of studies published between 1969 and 2012. The electronic databases ERIC (Educational Resources Information Center), PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, and ComDisDome were utilized to explore the relevant literature and studies regarding reading comprehension in content-area classes, for preservice and inservice teachers.

² The researcher selected the initial year to conduct the search for this review because 1969 was when the National Council of Teachers of English (NCTE) founded the Commission on Reading, which recognized the importance of reading in contrast to the previous emphasis on language arts instruction (Alvermann, 2010). In addition, Harold Herber published *Teaching Reading in Content-areas* in 1970, which was the first published research-based resource providing teachers' with literacy strategies for teaching reading in content-area.

Figure 4.1 Diagram of Search Terms (Inservice)



Primary database search. The primary ERIC database search for this review used the following key words or phrases: (a) content-area literacy and content-area reading, (b) reading comprehension strategies, and (c) preservice and inservice teachers. Figure 3.1 provides a visual depiction of the advanced term search. The original three terms were then expanded upon using synonyms. For example, *content-area literacy* was searched by the specific content-areas of reading language arts, social studies, science agriculture, biology, chemistry, geometry, mathematics, art, drama, music, and physical education. When possible, these specific content terms were also broken down further, such as mathematics (algebra, calculus, geometry), science (physics, biology, anatomy,

STEM), and social studies (civics, anthropology, political science, economics, history, geography). The exhaustive list of terms are documented in Figure 4.1.

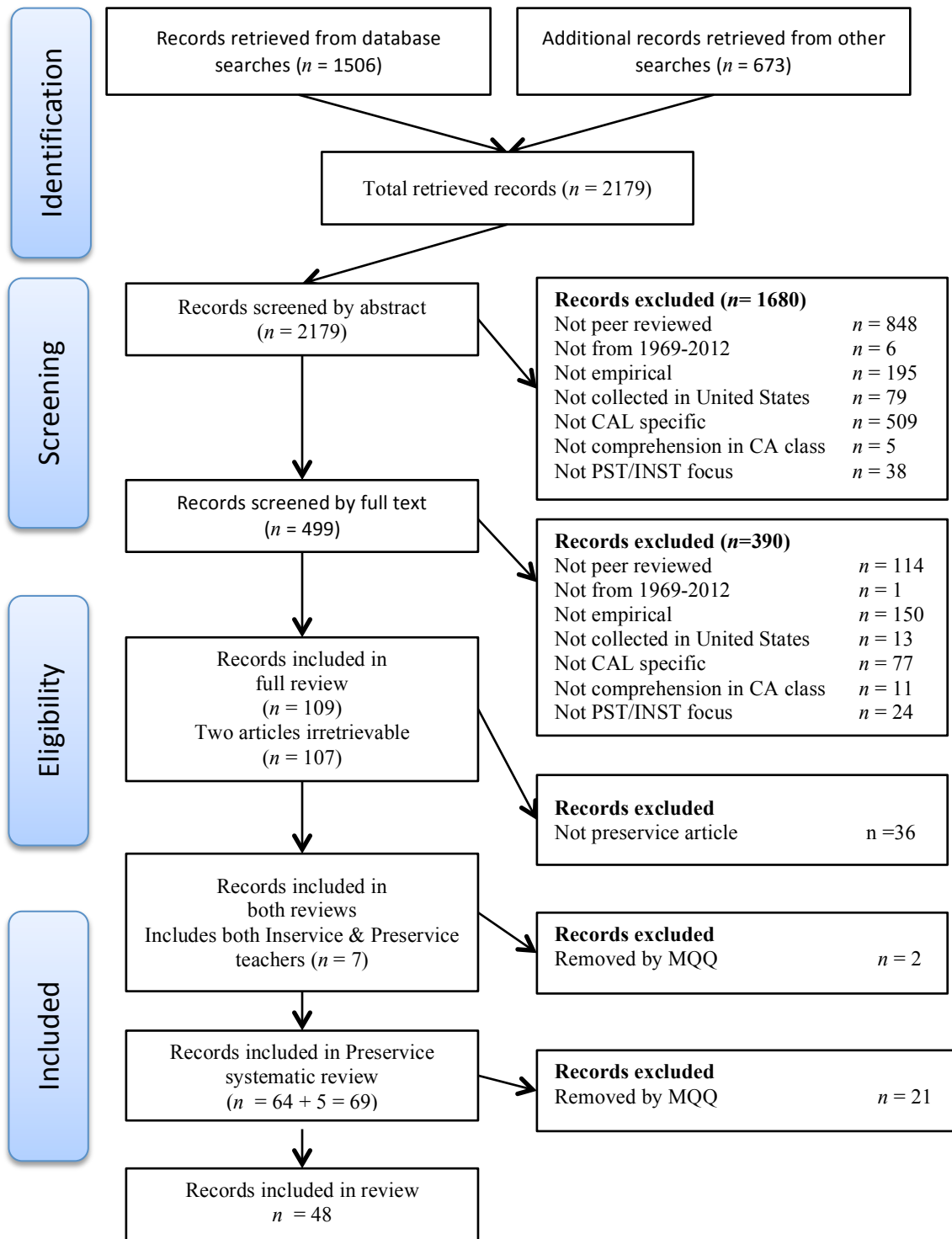
The remaining two search terms were deconstructed in an analogous manner.

Reading comprehension strategies included: reading, writing, reading instruction, advance organizers, reading skills, literacy skills, and literacy instruction. And *preservice and inservice teachers* were expanded with: teacher, secondary, higher education, preservice and inservice (with and without the hyphen). The final step in the key term search included a truncation process. Truncation is a process that uses words or symbols to replace letters with words, thus expanding the search. Terms truncated in this search included: strateg, read, teach, and instruct.

Secondary database search. Upon concluding the ERIC search, additional databases were searched: PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, ProQuest Professional Education, and ComDisDome. As described previously in the ERIC search, the same key term, secondary key term, and truncation searches were conducted.

Scopus search. Another secondary database search was conducted through SciVerse Scopus, an abstract and citation database used to identify additional studies for review. This comprehensive database searched and identified citations and references from the original study's reference list and provided secondary and tertiary citations.

Figure 4.2 Flow Diagram of Article Selection Process (Inservice)



Moher et al, 2009.

Manual search. After concluding exhaustive database searches, a manual hand-search for inclusionary studies was conducted at the citation level. The journals were hand-searched because the previously extracted studies were published in them: *Action in Teacher Education*, *Insight: A Journal of Scholarly Teaching*, *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *Journal Adolescent & Adult Literacy*, *Journal of Educational Research*, *Journal of Reading*, *Journal of Science Teacher Education*, *Literacy Research and Instruction*, *National Reading Conference Yearbook*, *Reading Horizons*, *Reading Improvement*, *Reading Psychology*, *Reading Research and Instruction*, *Reading Research Quarterly*, *The Clearing House*, *The Teacher Educator*, and *Teacher Education and Practice*.

Screening Criteria

After concluding all database searches, the selection process included several steps. First, each article was evaluated using the following the screening questions for inclusion:

1. Is the article published in English?
2. Is the article published in a peer-reviewed journal?
3. Is the article published between 1969-2012?
4. Is the article:
 - a. an empirical study?
 - b. based on data *collected* in the United States?
5. Is the primary focus of the article/research:
 - a. to examine content-area literacy instruction?

- b. to analyze reading comprehension in content-area instruction?
- c. to analyze the practices and instruction of preservice teachers and/or inservice teachers?

For studies to be included in this review, retrieved articles underwent a screening process. The inclusionary process was a close examination and screening of the articles according to the criteria listed above.

Articles obtained from the database, Scopus, and manual searches were initially screened at the abstract level. Articles meeting all eight criteria moved to a secondary screening. The secondary screening process used the same eight criteria; during which the articles were screened at the full-text level.

Methodological Quality Questionnaire Screening

The final screening process evaluated the articles for quality. To assess the methodological quality of the studies, an instrument entitled the Methodological Quality Questionnaire (MQQ), was adapted from the screening tool used previously by Risko et al. (2008) in addition to referencing the MQQ instrument implemented by Acosta and Garza (2011) in their research of evidence-based pedagogy. Each of the studies selected for inclusion from the previously mentioned criteria, was then analyzed for quality and effectiveness using all seven quality indicators (Risko et al., 2008). The MQQ followed the premise of Risko et al., with the following modifications: (a) Criteria 1.1 now states “explicated theory and /or previous research” instead of “theory and previous research.” (b) Criteria 2.2 was split to standards 2.2 and 2.3 to allow reliability and validity to be analyzed as separate components. (c) Criteria 2.4 now required more details regarding

the participants in the reviewed studies. For example, Risko et al. (2008) required “describes participants” (p. 43). However, this study’s Criteria 2.4 was more exacting and stated that the participants and sample must be characterized by age/grade/instructional level (if applicable). For preservice teachers, the study should include the level of instruction and the course(s) of instruction (e.g., methods course). (d) Additionally, criterion 3.1 and criterion 3.2 were merged into one criterion. Originally, criterion 3.1 stated, “Findings are consistent with intention of question/purpose,” and criterion 3.2 stated, “Findings are legitimate or consistent for data collected” (Risko et al., 2008, p. 256). Criteria 3.1 was changed to, “Findings and conclusions are legitimate or consistent with data collected.” In summary, this study added one criterion and excluded another from the original criteria published by Risko et al.; therefore, the original number of seven criteria remains the same for both studies.

Additionally, modifications were made to the original scoring process. Originally, Risko et al. (2008) only included studies in their review that met all seven criteria, and “the articles were assigned an overall score of 3 (meets all criteria), 2 (meets between four and six criteria), or 1 (meets three to zero criteria)” (p. 256). For this review, modifications were made to the Risko et al. scoring system. The revised scoring process included the following three options: (a) studies meeting all seven criteria were included in the study; (b) studies falling into a score range from 4-6 were re-evaluated by the researcher at a later time period; and (c) a score of 1-3 automatically excluded an article from the current study. This was changed prior to measuring for quality, to limit the additional steps. (See Table 4.1.).

Table 4.1 Methodological Quality Questionnaire (Inservice)

Standard	Quality Criteria
Standard 1: Provides a clear argument that links theory and research and demonstrates a coherent chain of reasoning. Explicates theoretical and previous research in a way that builds the formulation of the question(s).	1.1 Explicates theory and/or previous research in a way that builds the formulation of the question. Poses a question /purpose/objective that can be investigated empirically.
	1.2 Explicitly links findings to previous theory and research or argument for study.
Standard 2: Applies rigorous, systematic, and objective methodology to obtain reliable and valid knowledge relevant to education activities and programs.	2.1 Ensures that methods are presented in sufficient detail and clarity to clearly visualize procedures (another person could actually collect the same data). Data collection should be described that readers can replicate the procedures in a quantitative study and follow the trail of data analysis in a qualitative study. For a qualitative study, researcher should report some of the following: number of observations, interviews, or documents analyzed; if interviews and observations are taped and/or transcribed; the duration of the observations; diversity of material analyzed; and the degree of investigator's involvement in the data collection and analysis.
	2.2 Evidence of <i>reliability</i> ? Was this evidence provided from the data collected (e.g., describe coefficients, test-retest, Cronbach's alpha)? Did the researchers provide information about instrument development and study populations (e.g., content-area literacy strategies). For qualitative studies were characteristics provided: reliability, credibility, and/or trustworthiness were addressed and reported?
	2.3 Was evidence of <i>validity</i> provided for data collected (e.g. instrumentation-does it measure what it is designed to measure and accurately performs the function)? Information about instrument development and adaptations for specialized populations (e.g., content-area literacy strategies). For qualitative studies were characteristics provided: reliability, credibility, and/or trustworthiness were addressed and reported?
	2.4 Describes participants and the sample was well characterized? (<i>Description must include all of the following: age/grade/instructional level or type of PST/INST and content-area-if necessary</i>).
Standard 3: Present finding and make claims that are appropriate to and supported by the methods that have been employed.	3.1 Findings and conclusions are legitimate or consistent with data collected.

Adapted from Risko et al. (2008)

The MQQ displayed in Table 4.1 describes the seven criteria used to assess the methodological quality. The quality indicators were applied to all inclusionary articles in order to determine the overall methodological quality of each study. After reviewing the studies, the raters marked the study with the appropriate score, ranging between 1-7, with in the overall scoring of 1—exclude, 2—re-evaluate, and 3—include. The studies were then assigned an overall score of 3 (meets all criteria), 2 (meets between four and six criteria), or 1 (meets three to zero criteria). Only studies that meet all seven criteria were included in this review; however, all studies with a score between four and six criteria were re-evaluated. Any additional discrepancies were revisited and discussed until consensus was reached between the two raters.

Results

The preliminary database search yielded 1,506 articles from the five electronic databases: ERIC (Educational Resources Information Center), PsycINFO (a database of psychological information), Linguistics and Language Behavior Abstracts, ProQuest Education Journals, and ComDisDome. An additional 673 articles were retrieved through other searches (e.g. Scopus and manual searches). In total, 2,179 articles were screened. A breakdown of the database search and the article retrieval is detailed below in Table 4.2.

Table 4.2 Article Retrieval Breakdown (Inservice)

Retrieval Source	Retrieved Articles
ERIC (Educational Resources Information Center)	1483
PsycINFO (a database of psychological information)	6
Linguistics and Language Behavior Abstracts	10
ProQuest Education Journals	6
ComDisDome	1
SciVerse Scopus	648
Manuel hand-search	25

First, all articles were screened at the abstract level (Pettigrew & Roberts, 2006; Torgerson, 2003). This screening eliminated 1,680 articles from the review. The majority of the articles eliminated from the review did not meet the criterion 2, which required the studies to be published in a peer-reviewed journal ($n=848$). The majority of these were published in a book or offered as a conference presentation. Criterion 4a ($n=195$) removed articles due to the lack of empirical research. Any studies that collected data outside of the United States were eliminated for criterion 4b ($n=79$). Articles not meeting criterion 5a ($n=509$) were studies that did not focus on the instruction of content-area literacy. (See Figure 4.2).

The remaining articles ($n=499$) were then screened at the full-text level to assess eligibility. The articles were screened using the same initial inclusionary criteria and questions. During the secondary screening, the majority of articles were excluded due to the lack of empirical research ($n=150$), followed by criterion 2 ($n=114$) not published in a peer-reviewed journal, and 5a ($n=77$) the study does not examine content-area literacy instruction. The full-text screening resulted in 109 studies, including studies addressing

preservice and inservice teachers. For the purpose of this review, the final studies included in the methodological quality review focused on inservice teachers ($n=65$); with an additional seven articles that evaluated both preservice and inservice teachers, four of which acquired a high level of methodological quality, for a total of 69 studies. After evaluating each study for methodological quality, the final inclusive number in the review was 48.

Reliability

For reliability, the use of inter-raters was employed at several stages during the research process (during the abstract phrase, the instrument phase, and for the research design coding). First, after the original database search was completed, a total of 2,179 articles were screened at the abstract level. At this stage, the author with the assistance of two doctoral students of literacy education evaluated approximately five percent ($n=62$) of the studies. The doctoral students were in their first and second year of their programs, respectively. Both were enrolled in research methods and statistics courses, with experience evaluating research from a methodological and academic lens. Training was conducted with the inter-raters and the research. The training was conducted by reviewing the screening criteria questions and evaluating studies based on the questions, upon training completion, each rater applied the same screening questions to the randomly selected studies. A 92% rate of reliability was reached between the three raters.

At the next level, full text screening, the articles were reviewed on the seven criteria of the MQQ individually. Once each study was evaluated, the rater assigned an

overall score of 1-7 and indicated whether the study received a score of one to three (to exclude), a score of four to six (requiring the study to be re-evaluated), or a score of seven (indicating inclusion). For inter-rater reliability, a literacy education professor from another university—classified as high research activity and with experience conducting systematic literature review—assisted with the coding. After completing the inter-rater studies for Manuscript 1, the raters conducted a second training phase to regroup for the second manuscript. During the preliminary process, in order to support reliability the raters utilized the studies that were included in this review as well as in the Risko et al. study. These studies included previously measured studies, (Konopak, Readence, & Wilson, 1994; O'Brien & Stewart, 1990), which were also studies in Manuscript 1 due to evaluating preservice and inservice teachers. Next, the two raters evaluated the same ten articles; each article was evaluated based upon the seven MQQ criteria, resulting in possible score of 70 out of 70 criteria. Upon completion and discussion of coding, inter-rater reliability was calculated at 67 out of 70 of the criteria, with an overall value of 97%. To better support the numerical value and the overall score, each rater was required to provide a rationale and documentation on the coding form for each of the seven quality criteria and each study.

Method for Data Analysis

The final screening process evaluated the methodological quality of the studies ($n=69$), with the implementation of the MQQ. As previously stated, upon completing the MQQ for the 69 studies from the secondary screening, 48 studies were included for the final analysis. Of the final set, 28 studies were qualitative, 11 quantitative, and nine used

a mixed-methods approach. Additionally, examination deemed that four studies were quasi-experimental and two were true experimental. This preponderance of qualitative methodology (approximately 58%) is comparable Risko et al.'s (2008) findings, where approximately 62% of the final inclusive studies were qualitative.

Following the parameters applied by Risko et al. (2008) study, this review also analyzed the specific research topics identified in the studies. This analysis produced eight themes: professional development, beliefs and attitudes, knowledge, implementation, strategy use and practices, teacher quality, textbooks, strategies, and barriers. Next, the analysis was redefined (Risko et al., 2008) by identifying the conceptual foci of the studies. As the purpose of this particular review and research was to evaluate studies with foci on content-area literacy, three conceptual categories emerged from the abovementioned themes: (a) inservice teachers' instructional practices and implementation, (b) inservice teachers' beliefs and attitudes; and, (c) teacher quality and knowledge. A fourth topic of professional development was evident in all the inclusive studies and will be explained in more depth.

The three categories are administered as a tool to help define and align the research and the analysis of the studies. Although it is evident that the data set could be organized differently, the use of a seminal study aided the researcher in systematically organizing the studies in the following order. (See Table 4.3).

Table 4.3 Foci of Content-Area Literacy Research (Inservice)

<u>Study Author(s), year- alphabetical</u>	<u>Implementation / strategies / textbooks</u>	<u>Beliefs / attitudes / perceptions</u>	<u>Knowledge / teacher quality / barriers</u>	<u>Professional development</u>
Adams, A. E. & Pegg, J. (2012).	Implementation - enact			PD
Alger, C. (2009).	Implementation – use			
Alvermann, D. E., O'Brien, D. G., & Dillon, D. R. (1990).			Discussions	
Alvermann, D., Friese, E., Beckmann, S., & Rezak, (2011a).	Implementation			PD - online
Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b).	Implementation			PD
Bryant, D. D., Linan-Thompson, S., Ugel, N., Hamff, A., & Hougen, M. (2001).	Implementation Knowledge			PD
Bryce, N. (2011).	Implementation Textbooks			
Cantrell, S. C., & Hughes, H. K. (2008).		Perceptions Efficacy		PD
Cantrell, S. C., Burns, L. D., Callaway, P. (2009).		Beliefs (preparation)		PD
Carter, T. A., & Dean, E. O. (2006).	Implementation			PD
Conley, M. W. (1986).	Implementation			PD
Curwen, M. S., Miller, R. G., White-Smith, K. A., Calfee, R. C. (2010).	Integration – use			PD
DiGisi, L. L. & Willett, J. B. (1995).	Instructional – use			
Dowdy, J. K. & Campbell, D. (2008).		Beliefs Perspectives		
Dupuis, M. (1978).		Attitudes		PD
Fang, Z., Lamme, L., Pringle, R., Patrick, J., Sanders, J., Zmach, C., Charbonnet, S., & Henkel, M. (2008).	Implementation			PD

Table 4.3 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Implementation / strategies / textbooks</u>	<u>Beliefs / attitudes / perceptions</u>	<u>Knowledge / teacher quality / barriers</u>	<u>Professional development</u>
Fisher, D. & Frey, N. (2008).	Implementation			PD
Friedland, E. S., McMillen, S. E., & del Prado Hill, P. (2010).	Implementation – use			
Gerber, T. & Gerrity, K. W. (2007).		Attitudes		
Guzzetti, B. J. (1989).	Implementation			
Hairrell, A., Rupley, W. H., Edmonds, M., Larsen, R., Simmons, D., Willson, V., Byrns, G., & Vaughn, S. (2011).			Knowledge Teacher quality	PD
Kinney-Sedgwick, M. (1996).			Teacher quality Role of instructional practices	
Konopak, B. C., Readence, J. E., & Wilson, E. K. (1994).		Beliefs		
Lawrence, S. A., Rabinowitz, R., & Perna, H. (2008).	Instructional - use implementation			
Mallette, M. H., Henk, W. A., Waggoner, J. E., & DeLaney, C. J. (2005).	Instruction implementation and responsibility			
McKeown, M. G., Beck, I. L., Blake, R. G. K. (2009).	Strategy implementation: Summarizing, predicting, drawing inferences, and monitoring for coherence and misunderstandings			PD
Moje, E. B. (1996).	Implementation of strategies			
Muth, K. D. (1993).		Beliefs Textbook-use		
Ness, M. K. (2008).	Attitudes			
Ness, M. K. (2009).		Instructional practices		
O'Brien, D. G. & Stewart, R. A. (1990).	Beliefs Perceptions – resistance			

Table 4.3 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Implementation / strategies / textbooks</u>	<u>Beliefs / attitudes / perceptions</u>	<u>Knowledge / teacher quality / barriers</u>	<u>Professional development</u>
O'Rourke, W. J. (1980).	Attitudes			
Park, T. D. & Osborne, E. (2006).		Implementation practices		
Park, T. D. & Osborne, E. (2007).	Attitudes			
Quinn, R. J. & Wilson, M. M. (1997).		Implementation - writing		
Ratekin, N., Simpson, M. L., Alvermann, D. E., & Dishner, E. K. (1985).	Implementation			
Shanahan, C., Shanahan, T., & Misischia, C. (2011).	Implementation Think-alouds			
Simmons, D., Hairrell, A., Edmonds, M., Vaughn, S., Larsen, R., Willson, V., Rupley, W., & Byrns, G. (2010).	Implementation			PD
Smith, F. R. & Feather, K. M. (1983).	Implementation			PD
Smith, R. J. & Otto, W. (1969).		Attitudes		PD
Strahan, D., Geitner, M., & Lodico, M. (2010).	Strategy application			PD
Sturtevant, E. G. (1996).		Beliefs		
Sturtevant, E. G., & Linek, W. M. (2003).		Beliefs Perceptions		
Theriot, S. & Tice, K. C. (2009).		Beliefs		PD
Tixier y Vigil, Y & Dick, J. (1987).		Beliefs		
Wedman, J., & Robinson, R. (1988).	Instructional strategy practices			
Wilson, N. S., Grisham, D. L., & Smetana, L. (2009).	Strategy implementation			PD

Limitations of the Research

This review is one portion of a larger study in which the researcher attempted to systematically ascertain the research on content-area literacy as a whole, while evaluating the methodological qualities of the research and studies. Hence, this review has several limitations. First, as specified in one of the original inclusionary criteria, this review was limited to only including studies with data collected in the United States. This decision followed the guidelines of Risko and colleagues (2008), and the purposeful decision of the researcher. Though, several of the excluded studies were conducted in foreign countries, such as Taiwan, Turkey, Canada, Australia, and Great Britain.

An additional limitation is the limited amount of studies included, particularly those using quantitative methodologies. The final number of inclusionary studies was 48, down from the original number of 2,179 studies. This limitation obviously reflects the status of the field and quality of publications, but such a modest number of studies limits a researcher's ability to find overarching conclusions in specific area of interest. Accordingly, the methods employed in this study may be useful for other researchers who conduct research investigating content-area literacy and inservice teacher preparation in their country or in other countries. This review provides additional understanding of the methodology for conducting a systematic literature review.

Next, the organization of the review focused around the three conceptual categories, (a) instructional practices and implementation, (b) beliefs and attitudes, and (c) teacher quality and knowledge. These categories emerged from the inclusionary studies and the intentions of the researcher. However, it is necessary to acknowledge that

other categories or organizational patterns are highly plausible, depending upon the research questions and the research agenda of the researchers.

Finally, this review is limited to the research focused on reading comprehension, content-area literacy, and inservice teachers. The inclusionary research is restricted by the specified criteria, as the search was not limited to a particular grade level or content-area. The majority of the research is in the genre of INSTs continuing education (e.g., professional development training), instructional strategies and implementation, and INST knowledge of content-area literacy instruction.

Findings

The inclusive studies were organized into overarching themes and then conceptually organized into categories. The remainder of the review presents the findings of the studies and research.

Descriptive Characteristics of Studies

In order to develop a richer understanding of the research in this review, identifying characteristics were coded: participant population and characteristics, research method and analysis, setting, and area of discipline. This descriptive data was used to explain the content of the studies reviewed.

One hundred percent of the included studies ($n=48$) analyzed the topic of content-area literacy and inservice teachers' participants. Additionally, there were five inclusive studies that investigated both preservice (PSTs) and inservice (INSTs) teachers. Twenty-one (44%) studies were conducted in a professional development setting (e.g., inservice, training course, online course/discussion). Additionally, an

overwhelming number of the studies ($n=42$) evaluated INSTs in the secondary level, 4 studies were conducted with elementary INSTs (K-4), and 2 studies were conducted in the K-12 setting or did not specify the particular grade level—due to the nature of the discipline (e.g., music).

It is also important to acknowledge the interest and area in which the research was conducted. Twenty-five (52%) studies evaluated INST teachers in the instruction of literacy in the content-area class, specifically within the four core disciplines of instruction (e.g., English-language arts, mathematics, science, and social studies). Six studies investigated the incorporation of reading strategies in mathematics classes and science classes, respectively. Four studies were conducted in the context of social studies instruction, two studies combined the strategies and instruction of science and social studies, and the remaining studies were evaluated in other disciplines (arts-based instruction, music, mathematics and science, English-language arts, and social studies classes in contrast to the four core classes) with one study in each content-area.

In summary, the studies in this review focused on INSTs instruction and practices of content-area literacy within the context of professional development, analyzed strategies implemented during class instruction, and quantified INST knowledge and practice of content-area literacy. After further analysis, it was determined that 13 (27%) studies were conducted over the duration of a year or longer—one directing a three-year longitudinal study (Curwen, Miller, White-Smith, & Calfee, 2010), 11 (23%) studies were conducted under the duration of a one-day training to a one school-year (approximately 10 months) professional development study, and the

remaining studies did not specify a timeframe or measure participants' perceptions using surveys or questionnaires where a timeframe was not deemed necessary.

Findings from Implementation and Uses of Instructional Strategies

Emerging themes and categories were utilized to better identify the ongoing research trends within content-area literacy research. The majority of the studies ($n=28$; 58%) concentrated on INSTs instructional practices, implementation, and strategies of teaching in the domain of content classes (e.g., English-language arts, mathematics, science, and social studies). Content-area classes require discipline-specific instruction; however, to better support the learning of discipline material, instruction is guided through reading materials and technical vocabulary, requiring teachers to incorporate effective reading strategies (Carter & Dean, 2006). These reading strategies, admittedly not intending to encompass all practices, are an umbrella term for “teaching approaches that are purposefully used to create a cognitive shift in the learner” (Fisher & Frey, 2008, p. 246). Implementing instructional support and reading strategies provides students with engagement activities and facilitates learning, while making direct connections with the content and the learning process (Curwen et al., 2010).

Content-area literacy in the core content-areas classes. It has been suggested that reading instruction should be part of the practices and curriculum for content-area instruction; therefore, all teachers are teachers of reading *and* content (Vacca & Vacca, 1989). Teacher preparation and preservice training ultimately impact class practices and the amount of reading instruction in content classes. However, while preservice teacher

programs provide exposure for INSTs, this training may not be sufficient (Theriot & Tice, 2009), and therefore INSTs need additional educational opportunities.

When considering who should teach reading, teachers expressed some contradictions. Smith and Feathers (1983) concluded that content teachers believe that while there is a role and need for reading instruction; reading is not an essential component of content-area courses. Teachers feel a sense of responsibility for literacy instruction in all areas, but report using only a limited number of literacy strategies for content-area instruction (Mallette, Hank, Waggoner, & DeLaney, 2005). This uncertainty, pertaining to role of content teachers and reading provides the rationale and the need for extended inservice trainings that provide teachers with valuable insight and practice for integrating literacy strategies into secondary content classes. Whereas, short-term inservice trainings may be helpful, they are not adequate for tackling such a complex issues (Wedman & Robinson, 1988).

In particular, much research in content-area literacy situates on specific reading strategies (Conley, 1986). Through participation in workshops and the implementation of specific strategies, teachers acquire a higher level of knowledge; furthermore, questioning and in-depth discussions occur in the classroom and develop into enhanced lessons and routines. Wilson, Grisham, and Smetana (2009) conducted a year-long professional development (PD) providing INSTs with prolonged growth of demonstrations, theory, and opportunities for application with focus on the Question-Answer Relationship (QAR) strategy. The participating teachers showed improvement of metacognitive teaching with the use of the QAR strategy, which positively impacted

their instructional decisions. In contrast, as cautioned by Guzzetti (1989) INSTs having positive attitudes about reading instruction does not necessarily result in the implementation of reading strategies.

Table 4.4 Summaries of Studies—Implications and Uses of Instructional Strategies

<u>Study Author(s), year-alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Alvermann, D., Friese, E., Beckmann, S., & Rezak, (2011a).	N=2 prospective math teachers were paired with (N=2) middle school teachers.	QUAL Emails between all participants and researchers, the course syllabus, instructional texts, lesson planning, lesson plans, professor's feedback, semi-structured interviews	Case study, Bourdieu's cultural capital (both institutional and embodied), field, and misrecognition were selected as analytic tools.	Practice Knowledge Understanding Professional development (online)	The study results indicated that despite the focus of the study on domain knowledge through pedagogical mentoring, knowledge was effectively integrated with varied reading instruction. While reading teacher educators support practicing math teachers in content area instruction, there is a direct need for other sources of math for cultural capital.
Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b).	N=22 prospective and mentor teachers, 11 pairs of teachers.	QUAL Interpretive case study Emails between all participants and researchers, the course syllabus, instructional texts, lesson planning, lesson plans, professor's feedback, semi-structured interviews, discussions	Interpretive case study, analysis was a four-step process coding key items and documents though deductive and inductive methods. Discourse analysis for interpretation.	Practice Knowledge Understanding Professional development (online)	Study implications for literacy educators; acknowledge the value of collaboration, specifically in content instruction. Support the usefulness of affording students with opportunities of using and experiencing teaching strategies such as preactive and reflective.
Bryant, D. D., Linan-Thompson, S., Ugel, N., Hamff, A., & Houghton, M. (2001).	N=10 6 th grade middle school teachers (general and special education) (10 F, 8 C, 2 AA) 1 to 25 years experience 4-month professional development	MIXED Pre and post interviews, professional development evaluation forms, Intervention Validity Checklists (Vaughn et al., 1998), notes.	Analyzed and coded for frequency, descriptive statistics	Knowledge, instructional practices, barriers, perceptions	Numerous challenges for INSTs when teaching content area and using text-based material. Teachers are overwhelmed with issues of low socioeconomic status and the needs of English Language Learners. Although overwhelmed, the teachers provided adaptations for struggling students and recognized the need for instruction. The professional development had positive opinions and outcomes. Authentic literacy projects enhanced student learning. As gained from this research, teachers need to use the textbooks, but also provide supplemental resources.
Bryce, N. (2011).	N= 4 primary-grade teachers	QUAL Classroom observations, field notes, Interviews, lesson plans, curriculum materials, blank worksheets, samples of students' written work.	Naturalistic and holistic procedures	Challenges with using textbooks	Even with the challenges of teaching primary students with textbook-based instruction, teachers fostered a meaning-based approach to reading nonfiction. The students benefited from the focused instruction as teachers taught reading with strategies. The learning opportunities increased.

Table 4.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Cantrell, S. C., Burns, L. D., Callaway, P. (2009).	N=31 (final number=28) Middle-and high-school content-area teachers (23 F, 8 M) Content literacy professional development project (year-long) (7 science) 8 English/ language arts) (7 mathematics) (4 social studies) (2 reading)	QUAL Interviews (30-45 minutes), transcripts, observation (videotapes)	Analytic induction	Beliefs (perceptions) Professional development program	Content-area teachers believe that integrating literacy techniques into content area instruction and viewed themselves as content area teachers and literacy teachers. It was reported that the content literacy professional development project provided and supported the teachers' self-efficacy with literacy and content-area literacy practices. Professional development with cross-curricular connections, teamwork and collaboration, and coaching in content-area literacy instruction can have positive influences on content-area teachers' beliefs and perceptions of teaching literacy in the content-area.
Conley, M. W. (1986).	N= 3 middle school teachers (3 M) 8 years average of experience,	QUAL Knowledge test, open- ended questions, created and conducted three lessons, lessons were audiotapes, transcribed, and analyzed.	Classified responses, scored for correctness.	Knowledge, instruction, Professional development	Training related to the instruction, indicates that teachers would be knowledgeable about the purpose, goals, and procedures. Teachers often avoid literally questions and focus on the interpretative questioning. The training model and the three-level question technique was viewed as good and supportive for teaching the lessons.
DiGisi, L. L. & Willett, J. B. (1995).	N=184—and16 teachers were interviewed from the questionnaire sample	MIXED Questionnaire, interviews Self-reporting data	Constant comparative with preliminary categories Principal components analysis Multiple regression Univariate descriptive statistics;	Instructional use Textbooks	The study determined that biology teachers modify their instruction and use of textbooks according to the academic level of the students in the biology class. In the classes with lower academic achievement, the teachers provided the students with many reading activities, but expected the student to gain the biology content while in class. For the classes with higher academic levels, the teacher expected the student to learn from both the independent reading as well as the classroom instruction. The biology teachers viewed reading and the inquiry activities as vital components to the learning of biology. However, the biology teachers were unsure of when and how to incorporate the reading comprehension strategies in to their science instruction.
Fang, Z., Lamme, L., Pringle, R., Patrick, J., Sanders, J., Zmach, C., Charbonnet, S., & Henkel, M. (2008).	N= 2 6 th science teachers Monthly workshops Home science reading program	MIXED Gates-McGinitie Reading Tests, surveys, Curriculum- Referenced Science Test, monthly meetings, debriefing sessions, classroom observation summative reflective paper, email communications,	-tests, analysis of covariance, paired <i>t</i> -tests, inductive, constant comparative	Attitudes, Beliefs, Knowledge Professional development Textbooks	The two teachers embraced the reading instruction for science content. Reading was not just textbooks, but the use of reading strategies. Attitudes and beliefs were changed and reinforced their commitment to innovation and curriculum instruction.

Table 4.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Guzzetti, B. J. (1989).	N= 6 secondary teachers (science, mathematics, and music).	QUAL Observations, anecdotal record of field notes and video tape observations, semi-structured interviews, informal and formal interviews focused on planning, teaching, analyzing, evaluating, applying of teachers' decision making.	Constant comparative, compared across categories, within, between, among categories	Attitudes beliefs Instructional behaviors	There are differences between specific content areas and the strategies implemented for instruction. Competing demands of the teachers and administrative support. Not only do teachers need to be prepared to teach strategies, but the content in general. When teachers lack the content training, teachers focus on the content, rather than literacy strategies. Contextual constraints demand time and support.
Lawrence, S. A., Rabinowitz, R., & Perna, H. (2008).	N= 11 secondary ELA classrooms Study 1: 6-month investigation of 9 secondary ELA teachers Study 2: teacher- researcher Study 3: teacher- researcher	QUAL Semi-structured interviews and four classroom artifacts: (a) teaching resources and materials, (b) lesson plans, (c) portfolios, and (d) student work Field notes, memos, summaries Dyadic peer talks, discussions-tape recordings Student portfolios, student journals, assessments, lesson plans, observations data recorders in the teacher's reflective journal.	Multi-step, recursive, systematic process of patterns and themes in the data grouped in similar events to create typologies, Discourse analysis Discourse and content analysis	Practices Reading strategy selection and use	Study 1: Teachers reported that opportunities were provided for students to make connections for all types of texts. Text selection was based on expressed student interest and students were able to apply content-area reading strategies. The teacher-student conferences provided valuable information and insight and were used with 6 of the 9 teachers. This also helped to focus on the individual needs of the students. The ELA teachers combined literacy and literature, with various groupings, and reading comprehension strategies. Five of the nine taught the same strategies. Study 2: The dyads needed facilitated meaningful discussions. Using this strategy is beneficial for the students that are resistant as readers. Study 3: When the teacher-researcher used a balanced literacy approach she observed that students could provide more details about the story and instruction. Once the students had gained the knowledge of a new strategy or technique, it was beneficial for their reading and comprehension.
McKeown, M. G., Beck, I. L., Blake, R. G. K. (2009).	N= 6 intact 5 th grade classes N= 6 5 th grade teachers and 3 support staff = 9 (8 F, 1 M)	MIXED Lesson-text comprehension, lesson-texts- assessments. Classroom discussion transcripts from two of the five lessons, observations, audiotaped class lessons, exit interviews.	Analysis of variance and analysis of covariance, analysis of narrative texts and transcripts	Knowledge Strategy instruction Attitudes Content	From the first year, there were no differences of lesson-text comprehension, but the SVT showed differences on the lesson- text measure. A lack of difference suggested that the approaches did not provide the students with advance purposes for strategy uses. From the interviews, strategy teachers were satisfied and the basal-comprehension teachers were not satisfied with the approach and feeling natural teaching it. Five of the six teachers reported that they saw benefits in the use of the strategy approach. The comparison of the two approaches resulted in consistent findings, indicating that the lesson design and the instructional approaches were constant over the duration of the two cohorts.

Table 4.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Moje, E. B. (1996).	N= 1 teacher and her high school students (n=22), and (n=7) students interviewed	QUAL Intensive, long-term observation of a natural cycle of classroom culture, daily classroom observation, field notes, structured, semistructured, and informal interviews, audio and videotaped transcripts of daily lessons, artifacts, textbooks, handouts, laboratory exercises, Secondary data collection for students	Ethnography, constant comparative, identified emerging codes	Beliefs Practices	According to the analysis and interpretation, literacy was practices as a tool for helping the students to organize thinking and learning in the content. Literacy instruction was part of the teacher-student relationship, and the practice of literacy was an organizational tool and supported in the class culture. Literacy was supported by the views of the teacher and students. Participation was a commitment of the students, they used strategies taught and reinforced in the class and content. Findings explicitly support previous research that teachers should explicitly integrate and teach literacy strategies they can transfer to other domains of instruction and content-areas.
Park, T. D. & Osborne, E. (2006).	N=4 agriscience teachers	QUAL Teacher and students interviews, audiotaped and transcribed interviews, classroom observations	Themes and assigned codes through thematic analysis	Perceptions Attitudes Challenges Knowledge	The teachers in the comparison group implemented twice as many content-area literacy strategies as the treatment group. However, the students gained the same level of agricultural comprehension and motivation as the students in the treatment group.
Ratekin, N., Simpson, M. L. Alvermann, D. E., & Dishner, E. K. (1985).	N=8 content area classroom teachers (math, science, social studies, and ELA)	QUAL Classroom observations and document analysis, 1- minute intervals of recording, 40 sessions and 2000 observations	Matrix of data, categories, tallies. Participatory observation and categorical analysis	Instructional practices Resistance Textbooks	Teachers assumed the responsibility of presenting and clarifying concepts during instruction. While ELA and math devoted little or no time to small groups, social studies and science dedicated 4% and 12%, respectfully. There was little variance in whole class instruction, as lecture, discussion, or monitoring seatwork were the most popular forms of delivery. As strategies were used and implemented, the purpose and framework provided new information, and during the next step, information was gained through text, lecture, and media, and lastly, the large amount of time was allocated for instruction and information time. Most commonly used is the textbook, and in contrast, the textbook authors recommend using supplemental sources.

Table 4.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Shanahan, C., Shanahan, T., & Misischia, C. (2011).	<i>N</i> = 8 per team X 3 teams = 24	QUAL Individual interviews, expert think-aloud protocols, focus group meetings—were all audiotaped and transcribed.	Constant comparison, coded reading processes	Disciplinary literacy Knowledge	The three disciplinary areas differ in how they read and interact with texts in their specific disciplines. There are times when the experts engage in similar strategies for instruction, but the ways are varying and unique.
Simmons, D., Hairrell, A., Edmonds, M., Vaughn, S., Larsen, R., Willson, V., Rupley, W., & Byrns, G. (2010).	<i>N</i> =48 elementary 4 th grade social studies teachers (43 F, 5 M) <i>N</i> = 911 4 th grade students from 61 social studies classes	QUANT Pre and posttests: Gates-MacGinitie Reading Test-4 th edition—Passage Comprehension Subtext, Test of Reading Social Studies Vocabulary Subtest, Curriculum -Based Vocabulary Assessment, Social Studies Content Test, TAKS, Test of Silent Contextual Reading Fluency	Descriptive statistics, Chi- square Structure equation modeling with hierarchical linear model framework	Strategy interventions Professional development	There were reliable differences that favored both of the experimental conditions over the typical practice of the social studies content measure. The students in the vocabulary instruction outperformed their peers in the curriculum-based vocabulary assessment.
Smith, F. R. & Feather, K. M. (1983).	<i>N</i> = 18 students in 3 classes <i>N</i> = 3 teachers (social studies— 2 middle school, and 1 high school)	QUAL Systematic daily observations, interviews, written recording notes and quotes	Ethnographic— naturalistic approach	Perceptions Practices Instruction	It may be suggested that reading is not as important of a component of content courses, since little reading was assigned in the classes in this study. Perceptions and goals vary between the teachers and the students. Students –factual learning, teachers emphasize citizenship, and cognitive objectives.
Strahan, D., Geitner, M., & Lodico, M. (2010).	<i>N</i> = 49 high school teachers	QUAL Participant observers, interviews, observations, field notes, focus groups, and archival documents	Case reports, patterns, narrative reports, chronological analyses	Professional development Literacy coach Implementation Strategies	In order to establish a purpose and a strong role, the coach invested a large amount of time and energy; she focused on making and building relationships with the participating teachers. The collaboration between the individuals grew to include clusters of colleagues who were teaching the same content areas, and also involved grade-level teams. The literacy coach at this high school, though two years of collaboration with the initiative, they strengthened classroom practices that also integrated content-area literacy strategies into the classroom practices. The groups and clusters grew out of this practice, and there was a shift to learning communities. This research supported previous by other researchers, the teachers were more focused and accomplished.
Wedman, J., & Robinson, R. (1988).	<i>N</i> = 50 secondary teachers (English, mathematics, history, and science)	MIXED The Concerns Based Adoption Model Readiness questionnaire Use questionnaire Open-ended questions, pre and posttest	<i>t</i> -test, percentages	Professional development (in-service) Attitudes Knowledge Strategy use Concerns	The results reported form the study indicated that the professional development (in-service) sessions showed significant influence on the secondary teachers' attitudes, knowledge, concerns, with the use of content-area literacy strategies.

Table 4.4 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Wilson, N. S., Grisham, D. L., & Smetana, L. (2009).	N= 22 secondary teachers	QUAL Lesson plans, open- ended questions, single case study,	Themes and patterns were analyzed Coded Recursive process and thematic analysis	Professional development Knowledge QAR Understanding Metacognitive	The participating teachers learned about the QAR strategy and the framework of the instruction. They demonstrated knowledge in their reflections and through this process their descriptions changed. As the PD progressed the teachers gained a deeper understanding of the QAR strategy, and their lesson plans demonstrated a declarative understanding of the QAR benefits.

To further support the need for content-area literacy strategies, Fisher and Frey (2008) concurred that INSTs and students hold similar positive perceptions about content-area literacy strategies, although each group ranked the strategies in different orders—this was partly due to a difference in knowledge between the groups of participants. As INSTs are continuously reminded to implement instructional practices to support student learning in content-area instruction, Bryant, Linan-Thompson, Ugel, Hamff, and Hougen (2001) examined INSTs knowledge of their students’ reading abilities and the implementation of specific reading strategies. While the teachers’ acknowledged they felt overwhelmed by other external factors (e.g., socioeconomic status, special academic needs, and limited home printed materials), many of the teachers gained insight about the importance of implementing reading strategies into their instruction and content classes.

Professional development has been a vital part of continuing teacher education, through these organized trainings, teachers should gain participatory practice and be

afforded opportunities for collaboration. Therefore, several studies (Shanahan, Shanahan, & Misischia, 2011; Strahan, Geitner, & Lodico, 2010) examined the practices of mentoring and literacy coaching to develop literacy instruction for secondary teachers. It was concluded that through the combination of PD, collaboration, and literacy coach guidance, classroom literacy practices were strengthened and improved.

The investigation by Shanahan and colleagues (2011) demonstrated differences between three high school teachers in history, chemistry, and mathematics, and discipline experts (e.g., historians, chemists, and mathematicians). By utilizing think-aloud protocols, focus group discussions, and data sources, the researchers identified that the six disciplinary experts reading behaviors differ considerably. While the researchers discovered that participants engaged in similar underlying literacy strategies (critiquing the argument, text structure, visual and graphical information) the instructional delivery and uses differ by discipline, and once students develop basic literacy skills, their attention needs to focus on reading as though they are reading from the perspective of a historian, chemist, and mathematician.

Similarly, Curwen et al. (2010) conducted a three-year longitudinal study utilizing the Read-Write Cycle Project exploring the effectiveness of instructional strategies that integrate literacy and disciplinary knowledge in support of content knowledge. The PD provided an effective model for supporting INSTs in developing their own metacognition and building awareness in pedagogical practices and leading students to learning, scaffolding, and developing a deeper understanding in disciplinary instruction.

Content-area literacy in mathematics and sciences. Over the past few decades researchers have repeatedly documented that content-area classes infrequently use literacy strategies (Moje, 1996; Ratekin, Simpson, Alvermann, & Dishner, 1985; Smith & Feathers, 1983). Aware of resistance among content-area teachers' use of strategies, Moje (1996) conducted a 2-year ethnography observing a veteran teacher's and her students' use of literacy skills in a high school chemistry class. Moje's role as a participant and observer in the class offered her valuable insight. She concluded that the participating teacher practiced literacy as a tool for organizing, developing and promoting thinking in the context of the discipline, as well as developing a relationship with the students. However, even though the teacher provided the students with ample opportunities for participation in the class, the reading strategies in the chemistry class did not transfer to the students learning practices in other areas of instruction.

In more recent work (Adams & Pegg, 2012; Carter & Dean, 2006; Friedland, McMillen, & del Prado Hill, 2010), investigations into the use of literacy strategies in specific content classes became more common. Carter and Dean (2006) contended that use of reading comprehension strategies in mathematics yielded positive outcomes for the students in the class. Similarly, Friedland and colleagues (2010) found teachers promoted literacy instruction in mathematics classes. Adams and Pegg (2012) concluded that the teachers continued to align newly learned strategies with previous forms of instruction, and the use of content-area literacy strategies as a tool can produce positive student outcomes.

Teachers gain valuable experiences through their training and practices. Similarly, their knowledge of literacy and their content is crucial to their instruction. Friedland and colleagues (2010) acknowledge that although teachers participated in preparation programs, this may not have provided enough background knowledge to teach literacy instruction. A related outcome was reported by Park and Osborne (2006) who investigated the motivations and barriers faced by agricultural-science (ag-science) teachers for implementing content-area literacy strategies. With positive regard to implementing reading strategies, teachers were interested in learning and participating, but limited knowledge and confidence hindered the integration of literacy practices into their instruction.

From a critical lens, Alvermann, Friese, Beckmann, and Rezak (2011a) investigated both PSTs' and INSTs' understanding of content-area literacy instruction within mathematics content. In contrast to the findings of Alger (2009), Alvermann et al. recognized that despite the efforts of participants, an online, multi-leveled mentoring approach was unsuccessful in reinforcing how literacy instruction could support student learning of mathematical concepts. Whereas, the assumption was made that the PSTs would support the literacy domain, several factors obstructed the outcome of the study and the cultural capital (the resources gained by the participants "through the formal and informal educational experience" (Alvermann et al., p. 205) of PSTs was not embraced for teaching content-area reading in their future mathematics classes.

In another study lead by Alvermann, Rezak, Mallozzi, Boatright, and Jackson (2011b) the authors fused reading and writing through online instruction in an attempt to

observe and strengthen the participants' abilities to incorporate reading into the discipline of science instruction. Similarly to the findings of Alvermann et al. (2011a), the teachers never made the full connection with their mentor teachers through the online practices. In contrast, in this case, the participant gained a stronger appreciation for her own content knowledge that may enhance her delivery of instruction in the science classroom. In summary, infusing reading instruction with science and math curriculum is a complex task, but when educators integrate materials and texts with science instruction, students' science knowledge and learning will improve (Fang et al., 2008).

Content-area literacy and social studies. Only one study in the included research focused on the discipline area of social studies. Simmons et al. (2010) contend that reading comprehension and content-area literacy is supported through multifaceted strategies. While working within elementary social studies instruction, Simmons et al. drew comparisons between two experimental approaches for content comprehension. Findings demonstrated that students who participated in either instruction (comprehension or vocabulary) gained more content knowledge than the students in the control group, and the results indicated noteworthy effects on standardized measures.

Content-area literacy and textbooks. Textbook use is commonly associated with difficult content knowledge and dense technical vocabulary (Bryce, 2011). After observing 40 class sessions, Ratekin and colleagues (1985) confirmed that textbooks were the single form of text in the observed secondary classrooms. However, there were discrepancies across the disciplines, and the high school teachers more than tripled the amount of time with textbooks in comparison to junior high teachers. Textbooks were

used as forms of information, but importantly, as Ratekin et al. noted, “the teacher, not the text, was the primary source of information” (p. 435).

In a study with secondary science teachers, DiSigi and Willett (1995) examined how they describe the participating teachers’ instructional use of reading and textbooks. These researchers concluded that science teachers understand the importance of reading instruction in science content, and that science teachers are unprepared and unsure of how to incorporate reading strategies into the science curriculum. Similarly, Bryce (2011) addressed the challenges and practices of teaching reading and writing with nonfiction textbooks. As with any instructional tool, textbooks require support and facilitation for student learning. According to Bryce, the participating INSTs who instructed with science textbooks also embedded a variety of approaches to support student content learning. In related findings, Lawrence, Rabinowitz, & Wilson (2008) confirmed that when teachers provided students with opportunities to make connections across texts, the students were able to apply content-area literacy strategies.

Due to the nature of the reviewed studies in this section, it can be concluded that although the majority of the studies focused on instructional practices and implementing strategies, secondary and tertiary research agendas were also addressed. Such topics included: resistance, beliefs, barriers, and whether or not INSTs are prepared to integrate literacy instruction within the context of discipline instruction. When opportunities to engage and activate prior knowledge, teachers provide students with strategies to understand the relationships between what they learned previously and what they are currently learning (Carter & Dean, 2006).

Findings on Beliefs and Attitudes of Inservice Teachers

From the precursor research about content-area literacy (Smith & Otto, 1969), teacher beliefs and attitudes (e.g. resistance) have dominated content-area research agendas (Braam & Walker, 1973; O'Brien & Stewart, 1990; Ratekin et al., 1985; Smith & Feathers, 1983). Nevertheless, findings continue to be divided among INSTs beliefs and practices. In the following section, I will provide an overview of the inclusionary research as it pertains to INSTs beliefs and attitudes and content-area literacy instruction.

Convergent evidence indicates that PSTs and INSTs lack appropriate training and preparation for teaching reading instruction in the context of content-area literacy, which in turn effects their beliefs toward literacy instruction. Smith and Otto (1969) acknowledged that secondary teachers needed to incorporate reading instruction, but the continuous obstacle is INSTs knowledge of reading instruction. In their study, the participating 19 junior and senior high school teachers exhibited no substantial gains for improving their positive value of reading on the reading test and attitude inventory, but additional information gathered from their questionnaire suggested the teachers held a positive value toward improving their students' reading abilities and instruction.

Table 4.5 Summaries of Studies—Beliefs and Attitudes

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Adams, A. E. & Pegg, J. (2012).	N=26 science and mathematics teachers for two years Grades 6-12 (7 science) (12 mathematics) (7 both science & mathematics) two summer-long workshops	QUAL Online discussions, Field notes, classroom observations, lesson plans, reflections, student work for two years	Observation protocol, coding, triangulated findings and pattern analysis	Enactment and adapt to use Professional development encouragement Increase awareness	All participants incorporated content-area literacy strategies into instruction adapted for the contexts of their classroom. The teachers applied the strategies to the goals and instruction of their class, content, and current practices. With conflict, this did not result in failure to implement strategies, rather the need to modify to minimize conflict within their classroom practices and goals for instruction.
Alger, C. (2009).	N=4 (2 biology) (2 English) Teachers in their first year of teaching	QUAL Descriptive case study, Self-reporting Consecutive lesson plans, powerpoint presentations, transparencies, handouts, worksheets, readings, reference materials, observations, semi-structured interviews, questionnaire	Case study, simple counts, identification of patterns and themes in thematic analysis	Transference Strategy use Barriers	From the formal observation, there was some transfer of learned knowledge and strategies to the practical application in the INSTs' classes. The INSTs teach reading as it pertains to their specific content. The implementation of CAR strategies for first-year teachers is challenging. The INSTs were knowledge and taught valid and well thought out.
Dowdy, J. K. & Campbell, D. (2008).	N=11 teachers (11 M) (science, social studies, physical education, and art) PST & INST	QUAL Case study Triangulation, prolonged engagement, peer debriefing, member checks, and thick description. Transcripts, audiotaped interviews, reflections	Constant comparison, Inductive categories and questions emerging from the data	Knowledge Reflective Enhance reading and writing instruction	Three themes emerged from the questioning: what was learned in the arts-based class, examples of what is used, and the rationale behind using arts-based educational instruction in content- area classes. The teachers involved gained knowledge and information about teaching diverse students. The teachers provided evidence of growth of teachers and leaders who value the arts.
Dupuis, M. (1978).	N=59 Junior high school teachers Content-areas: English, reading, social studies, science/ mathematics, related arts	QUANT Pre and posttests: Reading knowledge test, criterion-referenced test. Statements survey Situations survey The teacher opinioinaire	Analysis of variance Matched pairs <i>t</i> -test	Attitudes	Reading teachers are knowledgeable of reading instruction, however, they need help prior to becoming effective resource teachers for content-area teachers. This can cause tension between content-area teachers. English teachers, according to this study, at the entry level of reading instruction are the best prepared. Pre and post test scores indicated that only two groups showed consist change on all five measures, which were the science/math group and the related arts group. After the pre test, English and reading scores were minimally higher than the other three groups pertaining content-area reading, but there was no significance on the post test scores.

Table 4.5 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Dupuis, M., Askov, E. N., Lee, J. W. (1979).	N=57 Junior high school teachers (F 36, M 21)	QUANT Pre and posttest Statements Survey Situations Survey Knowledge of Reading Skills Test, criterion- referenced test.	Three-way analysis of variance Two-way analysis of variance	Attitudes Content area reading project Knowledge	The teachers in the experimental group indicated significantly more change in their attitudes than the content group. Reading skills and perceptions of their own reading improved significantly. A yearlong content area reading program/inservice significantly changed the teachers' attitudes toward using and integrating content-area literacy.
Gerber, T. & Gerrity, K. W. (2007).	N=257 music teachers	QUANT Questionnaire	Descriptive statistics, analysis of variance, <i>t</i> -tests	Attitudes	According to the research, a recent shift in teacher preparation has shifted teachers' behaviors. The participating music teachers have positive attitudes toward reading instruction in the content class, although not overwhelming. However, there are still obstacles to teaching content-area literacy. The teachers had favorable attitudes towards teaching reading, but there was no significant difference for teachers who did not have training in their preservice program.
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994).	BOTH N=125 pst and inst teachers representing 10 areas, 58 pst and 46 inst secondary teachers education Content area methods course	QUANT Kinzer's (1989) instrument adapted Belief statements, lesson plans	Chi-square	Beliefs Orientations	Several limitations to the study, results indicate difference between the groups' orientations. PSTs favor interactive explanation of how reading happens, INSTs favored reader-based. Beliefs about reading, both PSTs and INSTs showed positive results for the reader-based orientations. Findings provide support suggesting that theoretical orientations of reading processes of teachers' reflects their instructional decision making process.
Moje, E. B. (1996).	N= 1 teacher and her high school students (n=22), and (n=7) students interviewed	QUAL Intensive, long-term observation of a natural cycle of classroom culture, daily classroom observation, field notes, structured, semistructured, and informal interviews, audio and videotaped transcripts of daily lessons, artifacts, textbooks, handouts, laboratory exercises, Secondary data collection for students	Ethnography, constant comparative, identified emerging codes	Beliefs Practices	The analysis and interpretation, literacy was practices as a tool for helping the students to organize thinking and learning in the content. Literacy instruction was part of the teacher-student relationship, and the practice of literacy was an organizational tool and supported in the class culture. Literacy was supported by the views of teachers and students. Participation was a commitment of the students, they used strategies taught and reinforced in the class and content. Findings explicitly support previous research that teachers should explicitly integrate and teach literacy strategies they can transfer to other domains of instruction and content-areas.

Table 4.5 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Muth, K. D. (1993).	N=99 Middle school mathematics teachers (94 F, 5 M)	QUANT Questionnaire	Pearson Correlation, descriptive statistics, frequency	Beliefs Practices Knowledge	Participants indicated they are generally undecided about their beliefs about how reading plays a role in the learning of mathematics, and role as the teachers in helping their students understand the reading of mathematics. However, they also said that they did not view textbooks as the major source of learning, but in contrast the teachers indicated that the textbooks are the primary source implemented in the classroom.
Ness, M. K. (2009).	N= 8 (4 middle school and 4 high school teachers) (2 MS science) (2 MS social studies) (2 HS science) (2 HS social studies)	MIXED Classroom observations, Open-ended interviews, (The Didactic Instruction of New Material and Didactic Instruction of Review Material)	Frequency, categories, coding, disaggregating, and categorical analysis	Attitudes Perceptions Beliefs Instructional practices	During 600 minutes of high school social studies, no explicit instruction for reading comprehension occurred and nearly no reading comprehension instruction. In the middle school, there was slight more focus on reading comprehension than the high school level. The majority of the teachers believed reading were important to the instruction and learning of the content, little emphasis or no instruction of reading was provided in the class setting. The instructional responsibility was on the content rather than the comprehension and understanding of the content. Teachers identified as content specialist, with an understanding of reading comprehension, but adverted the responsibility.
O'Brien D. G., & Stewart, R. A. (1990).	BOTH N=245 PSTs and 5 teachers Content area methods course	QUAL Precourse statements, surveys, learning logs, interviews	Constant comparative analysis	Resistance	Resistance to content area reading instruction: is based on global perceptions and viewed incompatible. Based on simple misconceptions; what appears to be resistance is a broader complex of PST's assumptions.
O'Rourke, W. J. (1980).	N= 120 high school content area teachers.	QUANT Questionnaire	Analysis of variance	Attitudes	Generally speaking, there were no statistically significant differences in attitudes between the junior and senior content teachers related to teaching experience. There were differences between the content areas taught. ELA were positive, while the other groups were average. These results were anticipated. ELA is more directly related to reading.
Park, T. D. & Osborne, E. (2007).	N=216 agriscience teachers	QUANT Survey/ questionnaire	Descriptive statistics, <i>t</i> -tests, bivariate correlation, stepwise regression	Knowledge Strategies Attitudes Practices	The participating teachers held positive attitudes about reading for personal use and as an instructional tool. However, the teachers lacked knowledge and resulted in a low frequency of use in the classroom.

Table 4.5 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Quinn, R. J. & Wilson, M. M. (1997).	N= 21+17+25 (elementary, middle, and high school mathematics teachers)	MIXED Questionnaire Open-ended questions	One-way analysis of variance Open coding	Beliefs Practices Attitudes Strategy use	There was no statically significant difference between the groups and attitude toward using writing in the teaching of mathematics. Time constraints are a continued issue-there is limited class time and prevented them from using writing to teach math concepts. Although teachers have favorable attitudes of literacy in math classes, these practices are not applied in instruction and writing instruction is included less than once per week.
Smith, R. J. & Otto, W. (1969).	N= 19 junior and senior high school teachers.	QUANT Pre and post instruction testing Attitude inventory Nelson-Denny Reading Inventory Tests, forms A & B.	RAVE (Reciprocal Averages Computer Program)	Professional development Attitudes	From the questionnaire, 13 of the 19 participants provided evidence that the reading course had positive outcomes. While 11 said they were more willing to include reading practices into their instruction. Seven indicated that they were already incorporating strategies into their class practices. Concurrently, the students were happy about increasing their reading abilities.
Sturtevant, E. G. (1996).	N= 2 high school history teachers	QUAL Extended autobiographical interviews (semi- structured), classroom observations, classroom documents, notes, informal discussions, and interviews and data collected from students and administration	Analysis took place during and afar with transcribed and anecdotal documents Constant comparative	Beliefs	Teachers' beliefs are strongly affected by the personal relationships with trusted peers, colleagues, teacher-friends, previous or current role models, and other students.
Sturtevant, E. G., & Linek, W. M. (2003).	N= 9 content area middle and high school teachers	QUAL Cross-case analysis, ethnographic techniques to gather and analyze data from the participants. Semi-structured interviews, classroom observations, artifacts and photos of the teachers' instruction	Coding for themes and categories, cross-case analysis, and grounded theory to frame inductively Categorical analysis	Beliefs Perceptions Teaching practice	All nine participating teachers had strong beliefs about meeting the learning needs of their students. As well as the value of interpersonal relationships, and lifelong learning. The teachers also reported effects of their own personal experiences, conditions, and professional development. The participating teachers overall had a strong focus of using literacy as an active and engaging learning tool in the classroom while meeting student needs.

Table 4.5 Continued

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL)</i> <i>Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Theriot, S. & Tice, K. C. (2009).	N= 6 middle school teachers Experience ranging 3 to 23 years Case study n=1.	QUAL Case study, semi- structured interviews, classroom observations, beliefs instrument (Leu & Kinzer, 1995)	Case study and themes	Beliefs Practices Knowledge Professional development (workshop)	A teacher belief impact what is taught and fosters students' learning. It is important to understand the need and purpose of instruction as well as the relationships between beliefs and practices. Teachers need to have a deeper understanding of the theoretical and philosophical underpinnings. Through the professional development, the teacher developed and gained awareness of teaching, appropriateness of instruction and additional struggle within the classroom (i.e., classroom management).
Tixier y Vigil, Y & Dick, J. (1987).	N= 237 (67 social studies teachers and 170 teachers in other areas [e.g. English, math, and science]).	QUANT Surveys/ questionnaire	One-way analysis of variance	Attitudes Beliefs Perceived use Reading strategies Textbooks	The only major differences determined were between junior and senior high school teachers was found in the "during" reading strategies. The junior high allowed time in class for reading, and was rated higher. While senior high teachers rated the desirability of reading higher than the self-report. According to the study, the social studies teachers perceived to have a higher perceived use of reading strategies. The differences between the ratings for attitudes were not trivial, but teachers often fail to implement strategies they believe to be important. And social studies teachers report that they use reading strategies more frequently than the science and math teachers.

In a survey of 170 secondary teachers, according to O'Rourke (1980) no differences were identified between INSTs attitudes for teaching reading in content-area classes by levels of experience, but there were differences between the content-areas. At a similar time, Dupuis and Askov (1978) assessed INSTs attitudes and differences toward teaching reading; they discovered that experiences, such as PD sessions with instruction and support in reading increased teacher attitudes toward teaching reading

within the content class. In a secondary study, Dupuis, Askov, and Lee (1979), identified that graduate level courses and inservice trainings in content-area reading can provide INSTs with a better understanding of the benefits of reading in content-area classes. Upon completing a year-long program, results indicated that the participating teachers' changes positively impacted their instruction, classroom practices, and student performances.

Because reading strategies are endorsed for the betterment of content-area instruction, Tixier y Vigil and Dick (1987) examined the discrepancies of teaching strategies versus teachers' perceived use. Ultimately, the question became: do social studies teachers believe reading and strategic instruction is used in classroom instruction? A survey of 307 social studies, English, math, and science teachers were reported. For the analysis, the researchers utilized the data collected from the other three content-areas as a means of comparison. The results indicated that the INSTs endorsed and supported reading strategies in content instruction, but, interestingly, the teachers' attitudes toward the use of reading strategies was higher than their perceived use.

Continued strategy use, such as writing is also a viable form of instruction utilized in mathematics courses. Quinn and Wilson (1997) evaluated writing practices in mathematics instruction. According to the survey sample, the teachers very seldom use writing in their class. Additionally, although writing could be beneficial, other factors detour the use of writing, such as students' poor writing abilities and a lack of time to focus on the specifics of writing instruction. However, while teachers had strong

attitudes toward using writing in mathematics instruction, their beliefs were not aligned with their teaching practices.

By developing a deeper level of understanding, the following two case studies analyzed how teacher beliefs affect their teaching. Sturtevant (1996) compared two history teachers' literacy-related instruction and beliefs. The findings concluded that both teachers' literacy instructional beliefs were complex and ultimately affected by personal relationships, school dynamics, teachers and students. Additionally, Theriot and Tice (2009) investigated teachers' knowledge development and beliefs of literacy as it pertains to their teaching practices. They reported that in order for PD sessions to be valuable, teachers' philosophical and pedagogical beliefs must align with the training. In their particular case study, the PD fell short for the participants because the trainings did not recognize the immense depth of knowledge needed for implementing in one's own class as well as the obstacles that teachers face on a day-to-day basis.

Traditionally, when talking about content-area instruction, the four core classes (English-language arts, mathematics, science, and social studies) are most commonly investigated. For example, Dowdy and Campbell (2008) investigated the beliefs of PSTs and INSTs in the context of arts-based instruction. The research team interviewed participants to understand their perspectives and practices of literacy and arts-based instruction. The authors found that integrating literacy instruction with arts-based instruction provides students with a stronger foundation to retain and comprehend content information. As with any content-area classes, multiple perspectives, strategies, and resources provide for a broader and more well rounded construct of knowledge.

Similarly, Gerber and Gerrity (2007) investigated the attitudes of music educators. Their research sought to discover whether or not music teachers employed reading skills into music instruction. Ultimately, music teachers have positive attitudes about teaching reading skills in music instruction, but lack adequate training, preventing full integration of reading instruction in music classes.

In an investigation of teacher efficacy and the effects of PD and coaching practices for content literacy instruction, Cantrell and Hughes (2008) conducted a year-long PD program. From the PD, teachers indicated improvements in their teaching of literacy practices. The additional coaching and collaboration were instrumental factors in developing the teachers' efficacy, but transferred knowledge and strategy use to their teaching and their students' achievement. In related research, Cantrell, Burns, and Callaway (2009) examined secondary teachers' beliefs about integrating literacy in content instruction. Through the support of the PD, the INSTs further developed and broadened their scope of literacy instruction. In both of these studies, the authors concluded that the PD, intervention, and coaching opportunities provided the INSTs with positive experiences to further develop their classroom literacy practices and beliefs towards teaching reading in the content classes.

Many teachers value reading instruction, but the struggle is often in the implementation. In a large-scale survey, Park and Osborne (2007) investigated the beliefs and practices of reading for secondary science (e.g., ag-science) teachers. According to the researchers, the participants held positive attitudes about reading from both a personal and instructional viewpoint. In contrast, their lack of training and

knowledge resulted in low transfer to actual classroom practice. Additionally, Ness (2009) suggested that secondary science and social studies teachers are uncertain about how to support reading comprehension. Their limited amount of time devoted to reading comprehension attributed to their espoused beliefs toward reading instruction.

As previous research has focused on the questions of analyzing what content-area teachers are doing in the classroom, how their beliefs affect their instruction, or how to combat teacher resistance toward content-area literacy, Sturtevant and Linek (2003) shift their attention to the exploration of the “outstanding” teachers’ perspective. In this study, the authors evaluate nine content-area teachers on their beliefs and decision-making for literacy instruction. Even though the teachers have personal differences and characteristics, they all had similar opinions regarding the qualities of good teaching. According to the participating teachers, qualities of a good teacher include: having student-centered classes, acknowledging student needs not only in the classroom, while valuing the teacher-student relationship, and “focus[ing] on lifelong learning” (Sturtevant & Linek, 2003, p. 83).

In conclusion, a total of 17 (35%) of the 48 studies in this review addressed INSTs’ beliefs and attitudes about reading instruction in content-area instruction. The studies are summarized in Table 4.5. Prior to the Sturtevant’s (1996) research, the extent of literature on literacy-related beliefs and practices of secondary teachers was limited, but since 1996, researchers continue to evaluate INSTs’ beliefs and attitudes. The main finding from this group of research is that changing teacher behaviors and attitudes is a long-range project (Dupuis & Askov, 1978), but through the practices of extended PDs,

as well as coaching and mentoring (Dupuis et al., 1979), INSTs demonstrate positive beliefs toward literacy instruction (Cantrell & Hughes, 2008). Further, teachers need continued direction and support after PD opportunities for practice and implementing reading instruction into content-area (Dupuis et al., 1979; Theriot & Tice, 2009). While teacher beliefs are complex (Sturtevant, 1996) the examination of INSTs perceived beliefs and attitudes is a step toward improving the teaching of reading (Tixier y Vigil & Dick, 1987).

Findings Regarding Knowledge and Teacher Quality

This final and smaller category evaluates teacher knowledge and teacher quality for literacy instruction. The final three (6%) studies included in this review encompass three decades of research pertaining to teacher quality. Teacher quality is defined as the “teacher’s use of corrective feedback, instructional pacing, and level of student engagement were among characteristics” (Hairrell et al., 2011, p. 254), which positively relates to student achievement.

Teacher quality is a combination of instructional practices, materials, and delivery, as well as a means of monitoring and assessing student learning. Facilitating class discussion and communication among students is a challenging task. For this purpose, teachers need to constantly engage students in active participation. To develop a better understanding of teacher knowledge and quality of instruction, Alvermann, O’Brien, and Dillon (1990) conducted a qualitative analysis of content-area reading assignments and subsequent class discussions. It was found that discussions in middle school classrooms vary in form from lecture to forums. The most common purpose of

the discussion was to facilitate comprehension of the content instruction; yet, the teachers frequently feared that the class would become restless and uncontrollable through extended discussion.

In addition to instructional strategies and implementation, another facet of teaching, is the teacher's role in the classroom and teacher quality. Kinney-Sedgwick and Yochum (1996) examined the perspectives and roles of INSTs and literacy educators on the context of content literacy instruction. The varying roles of teacher, learner, and text are entities of content-area literacy instruction. Results indicated that teachers were dependent upon published materials and had limited opportunities for students to evaluate and construct meaning. On the contrary, the literacy educators emphasized a constructivist viewpoint; their role as the teacher was to be a facilitator and the students to be participants constructing learning from the process (Kinney-Sedgwick & Yochum).

Table 4.6 Summaries of Studies—Knowledge and Teacher Quality

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of Participants and Setting:</u>	<u>Research Method & Data Source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Alvermann, D. E., O'Brien, D. G., & Dillon, D. R. (1990).	N=25 middle school teachers (19 F, 5 M, 20 C, 4 AA) 2 semesters Beginning to 10 years of experience (6 social studies) (9 English/Lang. Arts) (6 science) (2 health and human development	QUAL Field notes, videotaping and audiotaping lessons, structured interviews, observation,	Constant comparative analysis	Discussions	Middle school classroom discussions range from lecture, recitations, to open forums. The teachers lesson purpose influences the discussion. When facilitating comprehension, the discussion is most likely to be an open forum style. There were discrepancies between the intellectual definitions and the comments in the interviews. While teachers' interview statements reflect the fear they have for letting the students get out of control. Although discussions are instructional activities, they are also tools for social control that empower teachers.
Hairrell, A., Rupley, W. H., Edmonds, M., Larsen, R., Simmons, D., Willson, V., Byrns, G., & Vaughn, S. (2011).	N= 36 4 th grade social studies teachers 18-week professional development.	MIXED Demographic survey, online logs, audio-recorded intervention implementation lessons, teacher qualifications, open-ended survey items, instructional proficiency forms (students): GMRT- 4 Curriculum-based vocabulary (CBN- V), (TAKS), pretest and posttest data	Qualitative analysis, categories and majors themes Pearson Correlations, structural equation modeling	Knowledge, teacher quality Professional development, perceptions	From the structural equation model participants indicated three variables were related to the student performance. Teacher quality and fidelity both positively were related to student achievement. While the teachers who stayed aligned more closely with the professional development materials and instructions, students showed a greater achievement gain. Teachers reported that they believed that the instruction was having a positive influence on the students' vocabulary learning and comprehension.
Kinney- Sedgwick, M., & Yocum. (1996).	N= 15 5 th grade teachers (9 F, 6 M) (social studies and history) N= 4 university professors (1 F, 3 M)	QUAL Interviews, open- ended questions, audio-taped and transcribed	Analytical induction, check-coding, coding themes or constructs, pattern coding,	Views Textbooks	The majority of the participating teachers' perspectives of learning represent a traditional transmission model. The teachers were dependent on their text and accompanying materials and used a highly structured learning as knowledge transmitters. Distinct differences between using textbooks by teachers, compared to literacy professors-teachers closely used textbooks, while professors do not hesitate departing from it and using a variety of sources.

Research Findings

Previously, discussed in this section are the themes and categories that derived from the inductive analysis of all 48 studies. In this section, I will synthesize the findings from the research presented in this review. Specifically, the categories include: (a) inservice teachers' instructional practices and implementation, (b) inservice teachers' beliefs and attitudes; and, (c) inservice teachers' knowledge and teach quality. An inclusive table of all 48 studies and characteristics are summarized in Appendix B.

As educators and researchers, we need to improve upon the past, not repeat it. In order for this to be accomplished, we must reflect upon the work of past scholars and how these works can influence today's research and practice. Additionally, although content-area and secondary reading/adolescent literacy have become more distinct areas of study, content-area literacy continues to be relevant regarding strategic comprehension instruction in kindergarten through 12th grade content-areas.

First, many studies reported practices and instruction for implementing content-area literacy and literacy strategies (Adams & Pegg, 2012; Bryant et al., 2001; Carter & Dean, 2006; Conley, 1986; Curwen et al., 2010; Fang et al., 2008; Fisher & Frey, 2008; Friedland et al., 2010; Guzzetti, 1989; Lawrence et al., 2008; McKeown, Beck, & Blake, 2009; Mallette et al., 2005; Moje, 1996; Ness, 2008; Park & Osborne, 2006; Ratekin et al., 1985; Shanahan et al., 2011; Simmons et al., 2010; Smith & Feathers, 1983; Strahan et al., 2010; Wedman & Robinson, 1988; Wilson et al., 2009) are split between positive and negative findings (Adams & Pegg, 2012; Bryce, 2011; Curwen et al., 2010; Friedland et al., 2010; Strahan et al., 2010; Wedman & Robinson, 1988; Wilson et al.,

2009). All of the studies in the review provided perspectives and viewpoints of INSTs, and the perspectives of students and teacher educators were also provided in some. In addition, the studies examined content-area classes, students, transfer from PST preparation to INST practice (Alger, 2009), textbooks (Bryce, 2011; DiSigi & Willett, 1995), theory (Alvermann et al., 2011a), and coaching or mentoring (Alvermann et al., 2011a; Alvermann et al., 2011b; Cantrell et al., 2009; Cantrell & Hughes, 2008).

Second, beliefs and attitudes are a prevailing theme in the dialogue of content-area literacy—within both preservice teachers and inservice teachers, the observed perceptions and beliefs of INSTs influences their teaching, instruction, delivery, and implementation. From the late 1960s, when Smith and Otto began their research about content-area teachers' attitudes toward reading instruction, and now, 40-plus years later, research continues to examine INST beliefs and attitudes regarding reading instruction in content-areas. The methods of research also varied, from case studies (Sturtevant, 1996), observations (Ness, 2009; Sturtevant & Linek, 2003), quantitative measurements (e.g. surveys and questionnaires; Gerber & Gerrity, 2007; Muth, 1993; Park & Osborne, 2007; O'Rourke, 2007; Quinn & Wilson, 1997; Tixier y Vigil & Dick, 1987), and the remaining studies analyzed INSTs' beliefs and attitudes (Cantrell & Hughes, 2008; Dowdy & Campbell, 2008; Cantrell et al., 2009; Dupuis & Askov, 1978; Dupuis et al., 1979; Konopak et al., 1994; O'Brien & Stewart, 1990; Theriot & Tice, 2009; Smith & Otto, 1969).

Regardless of methodology employed in the studies, there were convergent findings within the literature regarding positive change towards attitudes in reading and

content-area literacy through PD programs but limited evidence of content-area teachers' use of strategies. A majority of post-secondary reading methods courses are taught with PSTs from all areas of discipline, conversely, there is limited research with regard to classroom transfer and their course instruction. Cantrell and Hughes (2008) presented findings that teachers experienced growth and efficacy in literacy instruction over the year of a PD project. Dupuis et al.'s (1979) teachers similarly indicated positive changes in their approach to reading instruction after participating in a PD program. An assumption to gain from these studies is the necessity of long-term PD, ongoing support, and time to develop and hone literacy instruction. Other studies (Gerber & Gerrity, 2007; Sturtevant & Linek, 2003) reported that teachers hold favorable views toward reading instruction in content-areas, and the results from O'Rourke's (1980) study reported favorable findings that were comparable with populations who had previously completed the instrument. According to other research, teachers admitted to having lack of knowledge (Ness, 2009), lack of use (Park & Osborne, 2007), or challenges understanding the strategies and implementing them into practice (Theriot & Tice, 2009).

Findings from studies in the last category, analyzing teacher quality, suggest that teacher quality instruction and delivery comes in many forms. However, the prevailing conclusion was: teachers knowledgeable in instructional practices and content are willing to implement and provide an environment for student-centered learning. As reported by Hairrell and colleagues (2011), effective instruction and high teacher quality has a significant impact on student achievement.

Related Findings within the Research

The primary, underlying challenge addressed by this review is to understand how to continue to educate and teach INSTs to instruct through content-area literacy strategies within the construct of content instruction. The four decades of research reviewed in this analysis has focused on INSTs preparation for content-area literacy instruction, with a particular emphasis on understanding their beliefs, knowledge, and training experiences for teaching literacy instruction in the content-specific classes. Because of this focus, this review separates itself from previously published reviews, which focused on overall reading preparation for teachers (Risko et al., 2008), content-area teachers' attitudes and practices toward reading in the content-areas (Gillespie & Rasinski, 1989), and preservice and inservice middle and high school content-area teachers' beliefs and attitudes regarding teaching reading in the content-area (Hall, 2005).

Most closely aligned to this review is Hall's (2005) review, in which she presented findings of both PST and INST content-area teachers' beliefs and attitudes about teaching reading within the context of a content-area class. Hall determined that it is a difficult task to promote change in INSTs' beliefs regarding content-area literacy, which leads one to conclude that content area literacy preparation at the PST level may be most beneficial. However, by also providing INSTs with worthwhile and on-going training can help teachers' stay abreast of curriculum and trends. Such training, which provides support for creating effective content-area literacy and disciplinary literacy strategies, can be supported through professional development.

Professional Development

According to several studies within this review, training and professional development can impact teacher uses and practices of literacy instruction in content-area classes. PDs can also have a lasting impression beyond individual teachers and advance school-level improvement in literacy and learning across content-areas (Cantrell et al., 2009). Similar to the findings of effective preparation of PSTs, PD programs and in-service trainings must do the same for INSTs: the PD must be meaningful, professional, and include mentoring and coaching to allow the teachers to see the realm of possibilities (Ness, 2009).

Continued instruction and training for INSTs is evident, though, several implications can be derived from the research in this review. First, PD programs should focus on integrating the strategies and practices in inclusive settings (Bryant et al., 2001); “if teachers are to acquire expertise through training, teacher educators must offer not only knowledge about instructional practices but also support for the thinking required for teachers to manipulate the practices according to different lesson goals” (Conley, 1986, p. 25). According to Curwen and colleagues (2010) and Wedman and Robinson (1988), teachers should have opportunities to collaborate, reflect, and demonstrate success in the instructional practices and techniques, and in order to improve INSTs’ knowledge—the instruction is best if long-term (Dupuis et al., 1979; Pressley & El-Dinary, 1997). According to Cantrell et al. (2009), “it is imperative that researchers examine ways in which content literacy instruction is supported” (p. 77) and teachers are comfortable with the instruction, rather than feeling unprepared to assist

struggling adolescents with reading strategies (Conley et al., 2005; Fisher & Ivey, 2005; Lesley, 2005). For this very reason, it is critical to acknowledge that 22 of the 48 (46%) of the studies were conducted in a PD setting. Although scholars make recommendations for further support, none of the studies provided information of further PD or coaching after concluding the study.

A Content Focus

During the eight years between Herber's 1970 publication of *Teaching Reading in Content Areas* and the release of the second edition in 1978, interest pertaining to content reading instruction increased. During the same time period the seminal work of Durkin and her colleagues (1978-1979) on reading comprehension instruction concluded that little attention was devoted to guiding the actual reading conducted during class instruction. Despite Durkin's recommendations, practical changes were not systemic about incorporating high levels of comprehension instruction into classrooms and, at the same time, literacy expectations have increased. Therefore, although reading comprehension and content-area literacy has historical precedence, due to increasing societal demands, technological advancements, and the lack of proficiency skills of children and adolescent readers—research continues to work toward meeting the evolving and dynamic reading demands of the future (Moore et al., 1983).

As this review examined the content-area and INST research of 48 studies from the past 43 years, there were hundreds of other studies that also provided breadth of research and knowledge. With regard to the parameters of the methodological quality, only a subset of research was included. These reviewed studies still provide a broad

perspective of content-area literacy instruction, INST instructional strategies and practices, beliefs and attitudes, and teacher roles and knowledge for implementing content-area literacy and reading strategies into content classes. In an effort to provide quality research in this review, the research employed several steps throughout the process, including the use of multiple raters.

With the established foundation of previously published reviews (e.g., Hall, 2005 and Risko et al., 2008) the researcher was able to draw upon parallels, differences, and trends within the research. The current review, included studies that overlapped with the relevant reviews. Four of the studies were included in the Hall (2005) review and two studies were found in Risko et al. (2008), and one study, O'Brien & Stewart (1990), appeared in all three reviews. Table 4.7 provides a visual representation of the overlapping research from the three reviews. From a research perspective it can be acknowledged that this information is helpful for reliability, that there was an overlap in the three reviews. However, this information is also overwhelming. With such large reviews and similar research topic, it may be anticipated that the overlap of inclusive studies may be a much higher number. Through analysis of the two reviews in comparison to the this review, the research demonstrates that although the studies included in the reviews have similar topics and agendas, the methods of investigation and review procedures can produce different outcomes. Second, all six of the reviews have interrelated findings in relation to INSTs' beliefs and attitudes (e.g., resistance) toward teaching literacy in the content class (Dupuis et al., 1979; Konopak et al., 1994;

Muth, 1993; O'Brien & Stewart, 1990; Tixier y Vigil & Dick, 1987; Wedman & Robinson, 1988).

Table 4.7 Overlapping Reviews—Inservice Teachers

Study	Reviews		
	Scott, 2013	Risko et al., 2008	Hall, 2005
Dupuis, M., Askov, E. N., & Lee, J. W. (1979).	X		X
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994).	X	X	
Muth, K. D. (1993).	X		X
O'Brien D. G., & Stewart, R. A. (1990).	X	X	X
Tixier Y Vigil, Y. & Dick, J. (1987).	X		X
Wedman, J., & Robinson, R. (1988).	X		X

The O'Brien and Stewart study was the lone study included in all three reviews, the researchers in this study identified that teachers have a depth of content knowledge, but with regard to literacy they hold an array of beliefs and attitudes towards teaching (Hall).

Quality Controls

This systematic review has closely followed the conceptual framework, protocols, and design to the critical analysis of research by Risko and colleagues (2008). The majority of the studies included in this review were predominately qualitative in nature ($n=28$; 58%) with similar conditions to the study conducted by Risko and the

research team, the majority of the research was conducted in professional development trainings, or in a classroom setting with active INSTs, and utilizing samples of convenience was the common method of participant selection. Through a paradigmatic approach, themes and categories emerged from the data sources (e.g., professional development, lesson plans, reflections, interviews, focus groups, observations and field notes from the INSTs' experiences in classroom teaching opportunities and experiences).

Upon completing the multi-step processes for attaining the final pool of studies included in this review ($n=48$), there was still a high level of discrepancy between the amount of details provided in the studies (e.g. participants, data collection, procedures, analysis, and how themes and categories were retrieved from the reported findings; Risko et al., 2008). Evidence of this discrepancy is found in the research design of the inclusionary studies. After applying the methodological quality instrument (MQQ) to the 69 studies from the secondary screening, 48 studies were included for the final analysis. Of the final set, 28 studies were qualitative, 11 quantitative, and nine used a mixed-methods approach. Additionally examination deemed four studies were quasi-experimental (Curwen et al., 2010; Dupuis & Askov, 1978; Dupuis et al., 1979; McKeown et al., 2009) and two (Hairrell et al., 2011; Simmons et al., 2010) were true experimental—whereas in the write up of McKeown and colleagues (2009), it was identified that the research team conducted two studies, the first of which was a quasi-experimental and the second was a true experimental.

These experimental studies provided quality research, which supports findings of observational studies that provide projective findings within research, classrooms, and

instructional practices. Whereas, the other 42 studies were non-experimental in nature and did not apply randomized participant selection. This data was obtained by the researcher with the aid of a secondary rater, while evaluating and categorizing each of the studies, the researcher also made note of the studies research designs. In order to provide a higher level of scrutiny to this review, the researcher and a secondary rater re-evaluated the research design of the 48 studies, and inter-rater reliability was set at 96% (46 out 38 of the studies) overall agreement. In the case of the two discrepancies, the raters resolved differences and assigned the appropriate research design with 100% agreement. Upon completion of the coding, it was established that in this review, there were two true experimental studies, and four quasi-experimental studies with treatment and control groups. The four studies classified as quasi-experimental evaluated teachers' metacognition in writing (Curwen et al., 2010), teacher attitudes toward reading (Dupuis & Askov, 1978; Dupuis et al., 1979), and the first study in the McKeown et al. (2009) investigated reading comprehension for strategy instruction.

Curwen and colleagues (2010) conducted a three-year longitudinal study utilizing the Read-Write Cycle Project exploring the effectiveness of instructional strategies that integrated literacy and disciplinary knowledge in support of content knowledge. The research team implemented instructional support and reading strategies providing students with engagement activities to facilitate learning, while making direct connections with the content and the learning process (Curwen et al., 2010). The research team also provided an effective model for supporting INSTs in developing their own metacognition and building awareness in pedagogical practices and leading students

to learning, scaffolding, and developing a deeper understanding of disciplinary instruction through a longitudinal professional development program. The authors employed qualitative and quantitative measures over three years. The study was implemented in ten public schools located within one school district. The purposive sampling of 18 elementary teachers occurred within the southern California vicinity. The Read-Write Cycle model became an effective form of professional development supporting teachers by developing their own metacognition and awareness of pedagogical practices.

In the research conducted by Dupuis and Askov (1978) and Dupuis et al. (1979) the studies investigated teacher attitudes toward content-area reading. In Dupuis and Askov, the participating teachers were part of a series of workshops over the period of a year, and the control group included teachers that were employed at the same school, but did not partake in the workshops. Results indicated that there are differences in INSTs' attitudes toward teaching reading; the authors discovered that experiences, such as PD programs with instruction and support in reading can be beneficial for improving teacher attitudes toward teaching reading within the content class. In a secondary study, Dupuis et al. (1979) identified that graduate level courses and inservice trainings in content-area reading can provide INSTs with a better understanding of the benefits of reading in content-area classes. The study utilized the same participants and instruments as the previous study, but applied different research questions. Upon completing the year-long professional development program, results indicated that the participating teachers' attitudinal changes toward content-area reading positively impacted their instruction,

classroom practices, and student performances. Additionally, McKeown et al. (2009) conducted two studies, the first quasi-experimental using a purposive sample, and the second study was true experimental with students randomly assigned. In study one, the researchers applied two content approaches, the strategies approach, and the basal approach. The participating students from a fifth grade classroom were already an intact group, where their reading instruction was part of the regular classroom instruction. After the first year, results indicated “no differences on one measure of lesson-text comprehension, the sentence verification technique [SVT—an applied assessment]” (p. 232), but there were differences on the other measurement. These results were ultimately in conflict, “as recall is a productive measure that may capture a higher level of comprehension than would a multiple-choice test, such as the SVT” (McKeown et al., p. 232). During the second year, with the permission granted from the school, the researchers were able to randomly assign the participating students to classrooms. By applying two instructional approaches (e.g., strategies and content, and basal comprehension) the results were consistent between the two years (McKeown et al.), concluding that the instructional approaches provided sufficient comprehension. However, although the differences were minimal, the content approach “showed a consistent pattern” (McKeown et al., p. 245).

Further analysis is necessary for the two true experimental studies (Hairrell et al., 2011 and Simmons et al., 2010). First, Simmons and colleagues (2010) compared to experimental strategy approaches utilizing content-area comprehension and vocabulary. The cluster-randomized study was 18-weeks in length and attempted to evaluate effects

measured by normative-referenced reading programs (Simmons et al., 2009). The randomized samples included 48 teachers and their 903 students from 15 school districts. The results from the structural equation modeling signified reliable differences. The findings favored both of the experimental conditions; in contrast to the traditional practice.

Similarly, Hairrell and colleagues (2011) examined teacher quality for students' comprehension and vocabulary performance. The 36 participating teachers and their students ($n=679$) from two school districts in Texas were part of an 18-week professional development program and the intervention was conducted three times per week for 30 minutes each session. Three reading comprehension variables emerged from the structural equation model. The variable revealed a positive relationship regarding the reading measure. Additionally, "teacher quality and fidelity were both positively related to student achievement on the standardized measure of reading comprehension", and "teacher quality was related to increased student achievement on a standardized measure of reading comprehension" (Hairrell et al., p. 254).

Conclusion

This review adds to the discussion and research of teacher knowledge, reading comprehension, literacy, and content-area instruction in two ways. First, the review provides a systematic synthesis of the 48 studies included that evaluate literacy, content-area instruction, and INSTs. As discussed previously, there are published reviews on content-area literacy, and content-area literacy regarding teacher beliefs and attitudes, but there are no published systematic reviews or meta-analyses on the topic that

inclusively and longitudinally assess literacy, for both content-area instruction and INSTs. Next, this review analyzed each study for methodological quality with the use of the MQQ. Therefore, this systematic literature review diverges from traditional literature reviews, due to differences in the applied MQQ instrument.

As this review is a portion of a larger study, the original search assessed 2,179 studies, resulting in the final 48 studies. Prior to INSTs entering the classroom, as PSTs, they are required (in most states) to take courses focused on reading instruction, often related to content-area literacy. But it is imperative for these courses to take into consideration the make-up of the students (e.g., school, preparation, prior knowledge, content-area instruction; Conley et al., 2005; Stewart, 1990) and whether or not this training prepares teachers for the real world classroom (Alger, 2009; Bean, 1997; Carter & Dean, 2006; Cantrell et al., 2009; Moje, 1996; Ratekin et al., 1985). While, several studies from this review have shown, some INSTs have positive belief and attitude changes regarding teaching reading, although the findings are not always consistent (Dowdy & Campbell, 2008; Gerber & Gerrity, 2007; Sturtevant, 1996; Theriot & Tice, 2009).

Research Questions

In the following section, I return to the original research questions. First: To what extent does content-area literacy impact inservice teachers' instruction of reading comprehension in the content-areas? Throughout this review, the research and studies have provided support for this research question. The reviewed research directly and indirectly impacts INSTs' instruction of reading comprehension. Prior to entering the

class, PSTs take a minimum of one reading course, although, the scope, sequence, and depth of such classes is often unknown. The findings in this review and the 48 studies provide evidence of efficacy for professional development, continued education, and support for content-area instruction. Teachers, whether they are resistant to the concept of content-area literacy or in support of classroom integration, are part of the process of developing lifelong learners. This goal for facilitating lifelong learners is attained not only through their content curriculum but also through integrating pedagogical tools. Outcomes of the reviewed studies indicate that the strengths of PD for INSTs provided extended time for application and implementation in the classroom, increased metacognition of instruction and strategies, and provided opportunities for teamwork and collaboration (i.e., in improving teachers' beliefs and attitudes toward literacy instruction). These studies, considered collectively also reveal notable weaknesses (e.g., depth of teacher knowledge, limited amount of time for practice or implementation, and participants conflicting theoretical underpinnings of the instruction or PD).

The second question that is addressed by the review was: What is the methodological quality of content-area literacy research for inservice teacher preparation? This information is found and supported through the work of the researcher and inter-raters pertaining to the systematic process in which articles and studies were reviewed for this study. The original number of 2,179 studies encompassed research that included both preservice and inservice teachers. However, since this review only addressed INSTs, the numbers in Figure 4.2 visually illustrate the findings presented in this analysis. There were 69 articles that made it through the preliminary and secondary

screenings, and were then assessed for methodological quality; the final 48 studies provided the body of literature included in this review. As previously mentioned, there were differences in the details provided in the research, but according to the MQQ measurement, the studies were of high quality and provide academic support to reading comprehension, content-area literacy, and INST preparation. The methodological strengths of the research were in directly stating the purpose for the research and the posed research questions as well as explicitly stating methods and providing sufficient details for replication or interpretation. The relative weaknesses of the literature were in the details and description of the participants, and linking study findings to previous research or theories. The reported evidence of reliability and validity was highly variable. Some studies provided detailed evidence of reliability and validity, for example information about the instrumentation and data collection measures. Other studies provided were vague and caused difficulties in interpreting information regarding appropriateness of measures and procedures, this was possibly related to the age of the study and change in publishing requirements, but not necessarily.

Lastly, the overall concentration of this review was to evaluate primary themes and trends observed within content-area literacy and INST research. The results identified eight themes and three primary categories that presented themselves within the research, the three categories were: (a) evaluating inservice teachers' instructional practices and implementation; (b) inservice teachers' beliefs and attitudes toward content-area literacy; and, (c) inservice teachers' knowledge and teacher quality. Additionally, several trends evolved from review; collectively these trends were

identified by reading and evaluating the studies chronologically. Research more recently published has focused on myriad of topics. This selection of studies were from the year 2000 and beyond. Trends in the research include: instructional practices and integration of literacy practices in content-area classes, the effects and uses of professional development programs, and a trend that carries across all four decades—INST beliefs and attitudes toward content-area literacy. Research conducted in the 1990s carried similar trends such as: beliefs, literacy instruction, and PD programs. While the research of the 1980s investigated PD programs, beliefs and attitudes, with increased interest in INST resistance toward content-area literacy instruction. Lastly, the 1960s and 1970s, a much smaller sample, all three studies evaluated INST beliefs and attitudes.

Summary

With regard to the summary of findings, four results emerged from this synthesized review. First, after completing an inservice or training on literacy instruction and strategies, teachers traditionally have positive beliefs and attitudes toward literacy instruction in their content-area class (Dowdy & Campbell, 2008; Gerber & Gerrity, 2007; Sturtevant, 1996; Theriot & Tice, 2009). In contrast, positive beliefs do not always transfer back to implementation or use within the classrooms. Although, much research continues to obtain these consistent findings, it is the secondary finding of this review that causes additional challenges. Second, teachers, in general, lack the appropriate training for literacy instruction integration. Barriers and other teaching challenges support this (e.g., textbook integration, teacher motivation, and knowledge of literacy strategies with application to the particular content). Teacher trainings and professional

development programs need to be more than a single day of training to improve teaching practices, rather it is essential for teachers to have continued support, as well as time to practice and develop and learned literacy instruction (Gerber & Gerrity, 2007; Sturtevant & Linek, 2003). The third result is the topic of instructional strategies. Although this review dedicated little attention to the actually literacy strategies, the majority of energy is directed at the umbrella terms of literacies or literacy instruction. I specifically searched for key words such as “strategies,” but despite this direct focus, few studies focused on teaching specific strategies (Alvermann et al., 2011a, 2011b; Conley, 1987; Fisher & Frey, 2008; McKeown et al., 2009; Moje, 2009; Shanahan et al., 2010; Wilson et al., 2009), but rather the concept of teaching literacy. The last result is resistance. In terms of content-area literacy, resistance will continue to be a constant issue (Fisher & Frey, 2008; Lawrence et al., 2008; Moje, 1996; O’Brien & Stewart, 1989; Otto, 1969; Ratekin et al., 1985; Smith & Otto, 1969), however, by providing teachers with long-term instruction and support, their instruction positively impacts student learning (Ness, 2008; NRP, 2000).

Since educational reform does not offer a quick fix, change and improvement needs continued practical and theoretical applications (Zygouris-Coe, 2012). Hence, content-area literacy, reading comprehension, and teacher preparation and training will continue to be an area of research. The ultimate goal should be finding the best practices for preparing teachers, which ultimately facilitates student learning and literacy attainment for all students across disciplines.

CHAPTER V

CONCLUSIONS

The overarching purpose of this dissertation research was to examine empirical content-area literacy research for preservice and inservice teachers. More specifically, it evaluated the methodological quality of content-area literacy research, while identifying the primary themes and trends within the content-area literacy research for both preservice and inservice teacher training.

From the early 1900s to current education practices of the modern times, calls have been repeatedly made to reform literacy instruction within the context of content-area instruction yet; this profound issue continues to inundate educational research in the 21st century. Despite these efforts of educators and researchers, additional research is still needed to understand the depth and breadth of effective literacy instruction for K-16 students, particularly to help students reach the highest levels of literacy in all disciplines. Additionally, as literacy demands continue to evolve with new information communication technologies (ICT), definitions of content literacy must also evolve to remain current with the demands of learners and the education system. Therefore, the task of determining effective teacher preparation for literacy instruction is a dynamic and complex undertaking.

Systematically reviewing the current literature highlighted the fact that content literacy research, while present over the four decades in focus, continues today by expanding upon previous work, by looking at trends and changes in policy. This study

served to not only organize and review peer-reviewed research, but also to evaluate the quality of research on the topic of content-area literacy research.

The overarching purpose of this dissertation research was to examine empirical content-area literacy research for preservice and inservice teachers. More specifically, it evaluated the methodological quality of content-area literacy research, while identifying the primary themes and trends within the content-area literacy research for both preservice and inservice teacher training.

The culminating products, two separate manuscripts developed from the one large-scale systematic review, are summarized below. Following the summaries is a brief discussion of the research as it relates to suggestions for future research. Additionally, this chapter will provide an overview of the previous chapters and research, a summary, and implications for future research and practice.

Chapter Summaries

Chapter I

The purpose of chapter I was to provide a general introduction to the study topic and rationale for the dissertation. The article provided a breadth of research spanning four decades, as well as multiple perspectives (e.g., from researchers, educators, and preservice and inservice teachers). The chapter also identified the research questions that guided this dissertation.

Chapter II

Chapter II presented a historical review of content-area literacy from the early 1900s to the present, incorporating current and most relevant practices. The chapter also

contained a brief review of literature, synthesizing previous reviews of research concerning literacy instruction related to content-area literacy, including reading comprehension.

Chapter III

Manuscript I was presented in Chapter III: Preservice teachers' beliefs and attitudes, knowledge, and instructional practices of content-area literacy. The review systematically synthesized 43 years worth of content-area literacy pertaining to preservice teachers. Three themes emerged from the inclusive studies: beliefs and attitudes, knowledge and reflection, and instructional practices and pedagogy.

Overwhelmingly, the research analyzed preservice teachers' beliefs, knowledge, and practices of content-area literacy instruction. It is gained from this review that, although preservice teachers' regard for content-area literacy is malleable through proper training and instruction, there is no guarantee that transference of knowledge will ensure practice in future classrooms. Additionally, as researchers and teacher educators, academic experiences within the teacher preparation phase needs to be meaningful and applicable for the PSTs and their future students.

Chapter IV

Chapter IV corresponds to Manuscript II: Inservice teachers' instructional practices, beliefs, and attitudes, and knowledge. In addition, three themes also emerged from this review: instructional practices and implementation, beliefs and attitudes, and teacher quality and knowledge. Furthermore, a supplementary fourth theme developed from the review, which addressed the method of teacher learning and knowledge through

professional developments (PD) or inservice trainings. From this review, the conclusion was inservice teachers are not opposed to integrating literacy instruction into content-area instruction. However, INSTs need appropriate training, tools, support (e.g., coaching and mentoring), and time to learn and apply acquired skills to real classroom opportunities and students.

Summary

Findings from both studies (Manuscripts I and II) revealed similarities in the research surrounding preservice (PST) and inservice teachers (INST) and content-area literacy instruction. First, both studies identified a constant theme in the research: beliefs and attitudes of PSTs and INSTs. These convergent findings indicate a need for further research and instruction in the complex relationships regarding teacher knowledge of comprehension instruction with their beliefs and attitudes of integrating literacy and subsequent implementation of content-area instruction. Ultimately the field wants to promote effective implementation of content area literacy instruction, so research solely on teacher attitudes towards implementation provides incomplete information. These constructs of teacher knowledge, teacher beliefs and attitudes, and classroom implementation are clearly interrelated and must be considered in reference to each other.

As noted, the topic of teacher beliefs and attitudes dominated the studies. This domination is likely in response to mandated content-area literacy instruction and earlier studies documenting content-area teacher “resistance” to literacy strategies (O’Brien & Stewart, 1990). Results indicate that, prior to entering the classroom, teachers have

produced their own individual beliefs about the need and purpose of literacy instruction and the role it will play in their content classroom, often stemming from their own learning experiences. In the preparation of PSTs, beliefs can be shaped by the instruction and training they receive in the teacher education courses, specifically their one reading methods course. Overwhelmingly, research has indicated that PSTs begin the course instruction with the notion that they are not responsible for teaching reading. Through this training, it is often recognized that PSTs' beliefs and attitudes are positively influenced by the course. Additionally, findings from both the PST and INST research suggest that maintaining these constructs of teaching and applying content-area literacy strategies is challenging but beneficial. However, research has minimally documented the transfer of the teachers' knowledge from their training to the classroom. This lack of transfer may indicate a change in beliefs with the transition to the classroom, or may be an indication of other obstacles that prevent teachers from providing instruction according to their belief systems, such as the demands for meeting district and state expectations, school demographics, curriculum, and high-stakes testing.

Therefore, the findings from the PST studies on beliefs and attitudes specifically impact research and training of INSTs. Thus, the findings are critical in understanding INST knowledge as well, in regard to content-area strategy implementation. Research indicates that indeed, beliefs and attitudes of INSTs influence their teaching and instructional choices. Due to these influences (e.g., time constraints, administrative support, and training), researchers contend that lack of appropriate training for teaching reading instruction impacts INSTs' belief systems and classroom instruction as it relates

to literacy. Through professional development and ongoing research (calling for literacy instruction) INSTs' beliefs and attitudes have positively developed, but this improvement is attenuated by school factors. Particularly, content specific teachers need time and instructional support to implement and sustain literacy practices into their teaching.

The second common theme is the instruction of literacy strategies in the context of content-area instruction for both PSTs and INSTs. As part of PST and INST training, the knowledge and pedagogical practices of teaching with literacy strategies promote a higher level of critical thinking, allowing students to acquire and understand the content material.

Content-area PSTs traditionally have only one reading course during their teacher preparation, but it is also necessary that PSTs have a solid knowledge base and experience with teaching literacy strategies in order to be effective in the classroom. However, as evident from this research and the work of others, only one class may not suffice to meet the preparation needs of PSTs (Hall, 2005). Studies that focused on research-based instructional practices, specifically when providing PSTs with opportunities for implementing strategies through scaffolding, reported that PSTs exhibited great efficacy and motivation for teaching literacy. Instructional strategies continue to be developed and introduced into practice and instruction; therefore, PSTs, but more importantly INSTs, need to be aware of effective strategies including both the implementation and the theoretical underpinnings tied to the instructional practices. Unfortunately, according to Alvermann and Moore (1991) content INSTs are heavily

reliant upon instructing with textbooks, and literacy strategies are only used intermittently. Nonetheless, research continues to indicate the importance of effective instructional strategies, helping students to utilize their learned strategies, while allowing students to make connections with text and other knowledge, and developing cognitive processes. Therefore, the research in reading comprehension instruction and classroom practices is persistently disconnected.

This recognized disconnect between research and practice calls into question the utility of current models of teacher training and provides evidence for the final theme—the characteristic of effective teacher training at both the PST and INST levels. It is necessary for PSTs and INSTs to be knowledgeable of content-area literacy and this knowledge can be gained through courses, training, and practical experiences. These are not the only method for PD, but rather contributing factors (e.g., collaboration, mentoring and coaching, and meaningful learning opportunities), which leads to higher levels of teacher effectiveness. PDs can contribute to lasting knowledge and learning, not only for the teachers, but for students as well. When the PDs are meaningful, professional, and provide opportunities for continued support and training, the results can have lasting and positive effect on the teachers’ instructional practices. Further, it must be cautioned that when the PD is not appropriate, professional, or does not align with the teachers’ needs; the PD can have a negative affect on attitude and instruction. In total, in the manner that textbooks are not a “one-size fits all” solution for students, PD is not a “one-size fits all” resource for teachers. Training at both the preservice and inservice level must recognize the complex relationships regarding teacher knowledge of

comprehension, attitudes and beliefs of integrating literacy and subsequent implementation of content-area instruction.

Limitations of this Study

This study has inevitable limitations that confined the research in various ways. First, both the PST and INST studies derived from one database search from three key search criteria: (a) content-area literacy and content-area reading, (b) reading comprehension strategies, and (c) preservice and inservice teachers. The inclusionary research was restricted by the specified criteria, as the search was not limited to a particular grade level or content-area. Additionally, articles had to meet the following five inclusionary criteria: (1) published in English; (2) published in a peer-reviewed journal; (3) published between the years of 1969-2012, and published prior to December 27, 2012; (4a) empirically examined the topic of reading comprehension for content-area instruction, (4b) study conducted and data collected in the United States, (5a) examined content-area literacy instruction, (5b) analyzed reading comprehension in content-area instruction; and (5c) analyzed the instructional practices of preservice teachers.

Next, an additional limitation was in the amount of studies included in the reviews, particularly those using quantitative methodologies, similar results were also found by Risko and colleagues (2008). Although, they do not provide an exact number, they do specify that due to the qualitative nature of the research, they applied “an inductive paradigmatic analysis process” (p. 257). The final number of inclusionary studies for the two reviews totaled 79, down from the original number of 2,179 studies. Implemented research methods may have been a contributing factor when the majority

of the research was qualitative, as determined by the researchers and the research question. This limitation obviously reflects the status of the field, and limits the ability of the current research to draw overarching conclusions in this specific area of interest. For example, while the majority of the reviews analyzed research conducted for secondary instruction, there were minimal studies that drew comparisons between elementary and secondary level instruction.

Another potential limitation of the reviews was the researcher's own bias. As a former teacher of reading instruction and college instructor for content-area literacy course, the researcher's invested interest in the mantra "every teacher a teacher of reading" (Alvermann, Friese, Beckman, & Rezak, 2011a, p. 206; Moore, Readence, & Rickelman, 1983, p. 424) could be perceived. Therefore, during the abstract level, full-text level, the instrument phase, and methods analysis, additional raters were utilized for inter-rater reliability.

Finally, the organization of the review focused around the conceptual categories: beliefs and attitudes, knowledge and reflection, and instructional practices and program implementation for first manuscript; and the implementation of instructional practices, beliefs and attitudes, knowledge and teacher quality for the second manuscript. These categories emerged from the inclusionary studies and the intentions of the researcher. In addition, it is necessary to acknowledge that other categories or organizational patterns are highly plausible, depending upon the research questions and the research agenda of the researchers.

Implications

While literacy instruction is an important tool for promoting content-area learning, in particular, this systematic review was designed to add to the existing literature by examining content-area literacy in conjunction with preservice and inservice teachers. Thus, this section addresses implications regarding the findings presented within the two studies, with regard to future research and practice. Multiple possibilities for future research emerged as a result of this systematic review.

Implications for Future Research

Research design in content-area literacy instruction for teachers, while prolific, contains persistent gaps. These gaps can be found in the methodologies, research topics or disciplines, and research quality. In terms of methodologies, gaps specifically pertain to several factors: study length, setting, participant selection (purposive, random), and data collection (e.g., case study, instrumentation). Study durations varied from one day (PD training) to three years (National Writing Project), but were typically limited to one semester for the studies evaluated in the first manuscript, or less than one academic school year for the second manuscript. Consistently, the researcher identified several limitations within the studies. Specifically, as addressed by a myriad of research, is the need for follow up or longitudinal studies, which may provide a greater scope of knowledge. Although highly and frequently recommended by researchers; unfortunately such follow up studies or longitudinal studies were rarely conducted.

In regard to setting, the majority of the PST studies in the first manuscript were conducted in either a class or course of convenience (the professor's or researchers'

course) or in the form of an instrument (e.g., survey or questionnaire). Studies included in the second manuscript typically used purposive samples, utilizing local teachers and/or students in intact groups for case studies, but the study settings were more diverse, and employed a variety of class content and grade levels, in contrast to the first manuscript.

In terms of research methodology, researchers often assign or develop themes or categories to support the research question or research design. Although, through this analysis, it was convoluted and raised even more questions, in support of future research, there needs to be a consensus or consistency. Many researchers were vague in their methodology, specifically their data analysis and taxonomy. Their analysis procedures were unclear, loosely defined, broadly stated, or not directly stated. For example, researchers stated they read and re-read for themes or patterns, coded for categories, or analyzed for emerging categories rather than providing rigorous, detailed research methods and data analysis. This significant evidence necessitates the need for consistency in data analysis and presentation. Such analyses may include the constant comparative method or categorical analysis. In support of evaluating research for methodological quality, this is critical for future educational research, specifically on the topic of reading comprehension for content-area literacy instruction.

Furthermore, as stated previously, the majority of the studies included in these reviews were qualitative in nature ($n=50$; 62%). Although included research typically applied high quality research methodologies, there were limited examples of quasi-experimental or experimental research. To better provide researchers and practitioners

with stronger evidence for which to base curriculum decisions, it is recommended that there be more experimental research.

Next, research topics and discipline were periodically askew. Much attention and focus was dedicated to the four core areas of instruction (e.g., English-language arts, mathematics, science, and social studies), without differentiation amongst topic area. More recently, another focus specifically connects math and science instruction, but this research base is still accumulating. There is particularly limited research focusing attention on the “other” or elective courses in regards to literacy instruction. Although there is crossover in strategy implementation, similarities and differences may arise from further research that considers disciplines uniquely.

An additional area for research is PST and INSTs with content-area literacy with regard to secondary language acquisition, diversity, and multiculturalism. The inclusionary studies did not address the topic of second language learners and second language development in terms of content-area and literacy instruction. Further research or a review addressing these topics and search terms may provide additional and multiple perspectives and would prove to be beneficial. Similarly, digital literacies, which NCTE defines as 21st century literacy skills, were under represented.

In response to change and educational reform, further research should evaluate the relationship between recent trends and changes in policy, with regard to PST preparation, INST training and professional development, and teachers’ knowledge, beliefs, and attitudes about teaching content-area literacy. How does teacher training and preparation play into the role of their role as a teacher of reading instruction? In addition,

further regard needs to be given to alternative certification and non-traditional teacher training due to the increasing numbers of teachers seeking alternative teacher training (Source?). Consideration should be attributed to non-traditional characteristics (e.g., learning strategies including: active, collaborative, cooperative and problem-based).

Furthermore, gaps in the quality of research are a critical focus for future research, although trends indicate that the rigor of research in this area is improving. With updated research protocols, much of the recently published studies were more succinct and concise in their presentation of the study, where as older studies tended to be limited in study details. Critical details included the instrumentation, such as whether the instruments had been piloted or assessed prior to implementation. Providing sufficient details about the research procedures (e.g., how the participants or data was obtained, the duration of the study, or participant information) was also problematic. Additionally, some studies would provide little or no information regarding the study methodology (e.g., observations and or interviews—length and time, analysis of records, and types of records), which limits generalizability and replicability for qualitative research. In support of more rigorous research, studies should include randomized control trials, therefore making substantive impact on the educational field, further research, and recommendations for policy.

Implications for Practice

In addition, for future research, it is also important to include the implications for practice. Instructional practices must be presented so that teachers can see their immediate utility. For example, promising results were evident in studies that evaluated

PSTs in field-based or practicum courses (e.g., tutoring), thus providing PSTs with the actual application of their instruction. Likewise, INSTs can also benefit from follow up or longitudinal studies, not only examining teachers beliefs, but including how they transfer their knowledge and practice into their actual pedagogical practices.

Additionally, as educators, we pre-assess our students in order to help guide and develop instruction; similarly, this applies to the instruction of PST and INSTs. Ask questions, and then listen to what the needs of the teachers are, provide research and experiential opportunities to benefit the teachers, their instruction, and most importantly, their students. Teacher preparation needs to acknowledge that promoting a positive attitude towards content-area literacy is only the first step in insuring the implementation of quality instruction. An important step, but it is not adequate to assume that attitude change will equate with future teaching. As PSTs are traditionally required to take a content-area reading course, minimal evidence is attributed to PSTs positive attitudes and their transfer of classroom instruction. Therefore, teacher educators must also consider depth of knowledge, instructional modeling, administrator support, and appropriate support for facilitation and implementation of literacy instruction.

Through investigation, the consensus among the research, concludes that preservice and inservice teachers perceived attitudes, beliefs, and practices toward content-area literacy is evolving and themes continue to emerge; whereas, it is the practice of teacher educators and the evaluators of curriculum and instructional development that need further assessment. Such research will provide evidence for

instructional practices, including how and what should be taught in content class, but also addressing issues of literacy.

Conclusions

The study reviewed the content-area research for the past 40 years and, through this evaluation, it can be concluded that both preservice and inservice teachers need direct, explicit, and systematic instruction. Similarly, they both need appropriate preparation and training to teach literacy strategies in support of content-area instruction. Thus, the advocacy of content-area literacy (O'Brien & Stewart, 1990) equips teachers with opportunities to meet the developmental and instructional needs of their students. However, training teachers is not enough; they must be afforded opportunities to learn and understand the importance of implementation. As education programs highlight the need for literacy instruction, professional development opportunities should do the same for inservice teachers (Ness, 2009). Therefore, content-area teachers who instruct through and with literacy strategies are setting up their students to be capable and successful readers.

Although researchers differ in their methodological research practices, they have been attempting to find a consensus among teacher preparation strategies and best practices for content-area literacy instruction. Returning to Gray in 1925, the statement “every teacher who makes reading assignments is responsible for the direction and supervision of the reading and study activities that are involved” (p. 71; Siebert & Draper, 2008) is debatable. However, teachers should be knowledgeable and understand the needs of their students. Whether it is for the current content instruction, or for

developing a deeper understanding of the content, students need the literacy ability to read the curriculum and effective reading instruction at all levels of education.

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APPENDIX A

INCLUSIONARY PRESERVICE TEACHERS STUDIES

<u>Study</u> <i>Author(s), year- alphabetical</i>	<u>Population & # of participants and setting:</u>	<u>Research Method & data source:</u> <i>Qualitative (QUAL) Quantitative (QUANT)</i>	<u>Data Analysis</u>	<u>Research Focus:</u> <i>Attitudes Applications Beliefs Conceptions Effectiveness Experience Knowledge Perceptions Practices Implications Instructional Methods Multiple literacies Orientations Strategies Strategy selection Metacognition Misconceptions Resistance</i>	<u>Study Findings</u>
Akerson, V. L. & Flanigan, J. (2000)	PST N=23 Language arts methods course	QUAL Writing logs and journals, videotaped class explorations	Pattern analysis, content analysis	Practices	PSTs' recognized the importance of writing in journals for a better understanding. Using language arts can help teach science, and PSTs were comfortable with their instruction. PSTs recognized that by integrating ELA in science, it provided more time for content instruction. The PSTs journals provided evidence that ELA was a tool to learn in the content area and a way to teach content
Alger, C. L. (2007)	PST N=18 (13 F) (5 M) Content area methods course	QUAL Final reflection, a question on the final exam, learning log, course reflection	Broad themes, coded into categories, categorical and thematic analysis	Knowledge Strategies	Emerging themes content learned and commitment. 16 of the 18 participants stated a direct connection between literacy and sociopolitical power. Eleven of 18 expressed that new knowledge of literacy and social justice is an important concept learned through the course and that their learning was affected through the experience.
Alvermann, D., Frieze, E., Beckmann, S., & Rezak, A. T. (2011a)	N=2 prospective math teachers were paired with (N=2) middle school teachers. PST & INST	QUAL Emails between all participants and researchers, the course syllabus, instructional texts, lesson planning, lesson plans, professor's feedback, semi- structured interviews	Case study, Bourdieu's cultural capital (both institutional and embodied), field, and misrecognition were selected as analytic tools.	Practice Knowledge Understanding Professional development (online)	The study results indicated that despite the focus of the study on domain knowledge through pedagogical mentoring, knowledge was effectively integrated with varied reading instruction. While reading teacher educators support practicing math teachers in content area instruction, there is a direct need for other sources of math for cultural capital.
Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b)	N= 1 PST in science and math secondary concentration.	QUAL Intervention lesson plans, emails containing reflections	Discourse analysis, coding, inductive and deductive content analyses, interpretive case study	Reflective practice Online learning	The study evaluated a PST's struggle with an online literacy course and how she made sense of the instruction and her abilities to use skills-based instruction. The PST produced a concept map that depicted the relation between science concepts and the specific vocabulary terms. By providing students with opportunities for approximations in online courses,

					this can be useful for the student(s).
Bean, T. W. (1997)	PST N=27(17F, 10M) Content area methods course	QUAL Interviews	Constant comparative analysis	Strategy selection	PSTs experiences with selecting content area reading materials and instructional strategies was provided flexibility across the discipline; however, the 10 participants interviewed, were more selective and narrow in their strategy use. Also, external variables impede strategy selection.
Conley, M. W., Kerner, M., & Reynolds, J. M. (2005)	PST N=125 junior-level teacher candidates Content area methods course	QUAL Threaded discussions and printed as transcripts.	Ethnographic procedures: Componential analysis and taxonomic analysis	Knowledge Practice	PSTs gained increased understanding of the role as future teachers; it is a form of entertainment, and concern of working directly with a student or student(s). They gained a more complex view of teaching, classroom management, experimenting with different teaching styles, and build upon student's knowledge and background.
Cox, B. E., Fang, Z., Cariveau, R., Dillion, D., Hopkins, & Nierstheimer, S. (1998)	PST N=33 Literacy block course	MIXED Pre and posttest course scores of concept map	Analysis of covariance, comparative analysis, compare and evaluate, concept map analysis	Knowledge	Two groups of participants (Earhart & Mapleton). The Earhart students had a statistically significant greater level of understanding and suggested that their experiences helped the PSTs identify appropriately with their maps and the pedagogical and content ideas. The group with the school-based students constructed richer and more professional concept maps.
Daisey, P. (2009)	PST N=124 (67 F, 57 M, 116 C, 8 AA) Content area methods course	MIXED Pre, mid, post, and follow-up Surveys, open-ended and likert, student quotes	Frequency Chi-square Analysis of variance, constant comparison analysis	Attitude Beliefs	Findings suggest that secondary PSTs that reflect upon their own positive experience with reading may benefit their teaching for future classes and students.
Daisey, P. (2012)	N=67 (37 F, 30 M), (63 C, 2 A, 2 AA) (17 social studies) (16 math) (11 English) (4 Spanish) (4 integrated science) (3 art) (2 business/marketing) (2 communication arts) (2 Chinese) (1 chemistry) (1 computer science) (1 automobile technology) (1 biology) (1 Japanese) Content area literacy course, 30-hour field experience	MIXED Quasi-experimental Post semester survey, likert questions and open-ended questions	Paired <i>t</i> -tests and Spearman correlations, constant comparative analysis	Beliefs Experience	PSTs' perceptions positively changed regarding tradebooks, biographies, and before, during, and after lessons. They also expressed increased enthusiasm for their integration of future reading instruction. Field experiences can be beneficial for both inservice and preservice teachers.
Donahue, D. M. (2000)	PST N=10 Content area methods course	QUAL Case study Reading journals and inquiry projects	Inductive coding: patterns	Beliefs	PSTs valued reading, but did not value the reading instruction needed for science classes. PSTs balanced the interest of promoting reading and science materials. The PSTs learning with journals provided a new appreciation of reading, rather a technical tool.

Donahue, D. (2003)	PST N=4 (4 F) Content area methods course	QUAL Reading logs	Inductive coding: themes, categorized content	Metacognition	Math and ELA PSTs indicated increased knowledge of reading across disciplines. Recognized that knowledge of reading (strategies/journaling) contributed to the process of making meaning from texts.
Dowdy, J. K. & Campbell, D. (2008)	N=11 teachers (11 M) (science, social studies, physical education, and art) PST & INST	QUAL Case study Triangulation, prolonged engagement, peer debriefing, member checks, and thick description. Transcripts, audiotaped interviews, reflections	Constant comparison, Inductive categories and questions emerging from the data	Knowledge Reflective Enhance reading and writing instruction	Three themes emerged from the questioning: what was learned in the arts-based class, examples of what is used, and the rationale behind using arts-based educational instruction in content-area classes. The teachers involved gained knowledge and information about teaching diverse students. The teachers provided evidence of growth of teachers and leaders who value the arts.
Feret, A. J., & Smith, J. J. (2010)	PST N=8 (8 F) (2 M)	QUAL Reflective summaries and quotations.	Analytic induction and denote contrasts in patterns and categories	Knowledge	Indicated that PSTs gained new knowledge about themselves as a practitioner and their students during the course and placement. Through experience and lessons, the PSTs realized that by incorporating literacy instruction, it enhanced creativity, the quality of the projects, and developed critical thinking.
Freedman, L. & Carver, C. (2007)	PST N=66 students over 5 semesters. But for this article N=32 Art education Content area methods course during student teaching	QUAL Students' written work, field-based reflective essays, self-assessments, reading logs, child study reports, and a unit plan.	Action research study, narrative analysis to analyze written text and grounded theory, constant comparative	Knowledge Strategies	Through field-based reflective essays, self-assessments, reading logs, child study reports, and unit plan PSTs began making connections between literacy strategies and learning strategies and recognized the importance of scaffolding and modeling strategies for students to implement. The participants gained the necessary knowledge of theory and practices to facilitate learning for student in content knowledge.
Fritz, A. E., Cooner, D., Stevenson, C. (2009)	PST N= 84 Content area methods course	QUANT Pre and post-questionnaire, three open-ended questions.	Descriptive statistics, factor analysis, reliability analysis, and analysis of variance	Attitudes Beliefs Knowledge Perceptions	PSTs overestimate their understanding of literacy strategies prior to taking a content area reading / literacy methods course. Upon completion PSTs intention to incorporate literacy strategies increases and the participants' attitudes is positive, with ELA teachers the strongest of the beliefs in engaging students' prior knowledge.
Hollingsworth, S., & Teel, K. (1991)	PST N=2 Content area methods course	QUAL Interviews, observations of 20 student teaching sessions, examination of course materials, texts, assignments.	Constant comparative analysis	Beliefs Perceptions	The two beginning PSTs can learn the value of theories that support content area reading instruction, the curriculum decisions made do not include the teaching of reading. Although content area methods courses can provide evidence of support, the participants did not fully accept the integration and need of literacy instruction.
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994)	BOTH N=125 pst and inst teachers representing 10 areas, 58 pst and 46 inst secondary teachers education	QUANT Kinzer's (1989) instrument adapted Belief statements, lesson plans	Chi-square	Beliefs Orientations	With several limitations to the study, results indicate difference between the groups' orientations. PSTs favor interactive explanation of how reading happens, INSTs favored reader-based. For beliefs about reading, both PSTs and INSTs showed significant results for the reader-based orientations.

	Content area methods course				The findings provide support that suggest that theoretical orientations of reading processes of teachers' reflects their instructional decision making process.
Lesley, M. (2004)	PST N=25 (15 M) (10 F) (24 C) (1 AA) Postbac students Content area methods course	QUAL Teacher researcher Field notes, reflective journal, and an archive of student writing, transcriptions of key discussions, analysis of student questions.	Constant comparative of field notes, analysis of vignettes, and periodic member checking, cross comparative analysis of data sets	Beliefs Instructional methods	Certification students gained knowledge and perspective about the use and need of content area literacy instruction. Through critical questions, exploring diverse perspective, and facilitating discussions, participants viewed literacy as a tool for advocacy.
Lesley, M. Watson, P., & Elliot, S. (2007)	PST N= 47 Content area methods course	QUAL Classroom observations, field notes, student and researcher debriefing sessions, follow-up focus group, reader-response writing	Typology of cognitive strategies, categories coded with inductive analysis (Keene & Zimmerman (1997)	Attitudes Beliefs Metacognition	Students relied primarily on text-to-self connection, rather than both text-to-world and text-to-text. And negatively rooted attitudes toward reading, thus the students primarily relied on nonproficient reading strategies.
Nokes, J. D. (2010)	PST N=119 (87 F) (32 M) Methods of teaching social studies course(s)	QUAL Open-ended responses, exams, papers written during candidates practicum experience	Practice-based research; reading reflection coding	Effectiveness Knowledge	Participants recognize the need to change traditional literacy practices (e.g. textbook) to including documents, fictions, and nonprint texts. PSTs identify the role of literacy instruction to provide support for content classes.
Nourie, B. L. & Lenski, S. D. (1998)	PST N= 90 and 113 (2 groups) Content area methods course	QUANT Pre- and post attitude surveys	Frequency data	Attitudes	No difference from pre to post-survey scores. Both preservice and in-service teachers are still resistant to content literacy as an instructional approach, but he findings indicated that the participants have favorable attitudes toward teaching reading strategies in the content area class.
O'Brien D. G., & Stewart, R. A. (1990)	BOTH N=245 PSTs and 5 teachers Content area methods course	QUAL Precourse statements, surveys, learning logs, interviews	Constant comparative analysis	Resistance	Resistance to CAR instruction: is based on global perceptions and viewed incompatible. Based; on simple misconceptions; what appears to be resistance is a broader complex of PST's assumptions.
Olson, M. R. & Truxaw, M. P. (2009)	PST N=24 Science and mathematics teaching methods course	QUAL Field notes and recorded students, analysis paper. Researcher reflective notes and written memos	Patterns and inductive analysis	Knowledge Practices	Teachers need to understand literacy practices of the content area, but also the needs and literacy practices of the students.
Pytash, K. E. (2012)	N=41 (9 art) (1 business) (2 dance) (2 health) (3 music) (2 physical education) (11 science) (12 social studies) Content area methods course	QUAL Open-ended questionnaires, correspondences, unit of study projects, written reflections, focus group interviews	Constant comparative analysis	Experience Practice	Through engaging opportunities, PSTs' perceptions of how to teach writing changed. Originally, writing was not part of the teaching process of a content class, by the end, the method and approach is purposeful in content instruction.
Reinke, K., Mokhtari, K., & Willner, E. (1997)	PST N= 123 elementary education majors approx. age = 21	QUANT Pre- and post perception surveys	Repeated measures multivariate analysis of variance	Perceptions	Integrating the instruction of math, reading, and writing in the classroom was positive among the participants, as well as positive perception change for improving reading skills can lead to better

	Methods courses (reading, mathematics, and integrated reading & math for elementary majors)				understanding of mathematics, and improve math problem solving. No significance of perceptions for integrating reading and math methods subject.
Sheridan-Thomas, H. K. (2007)	PST N=64 graduate level Content area methods course	QUAL Written work: online discussion forums, reflective learning logs, paper for the required course.	Analyzed inductively, using categorical analysis	Application Knowledge	PSTs constructed knowledge of multiple literacies and applied their understanding to lesson planning. This course and instruction provided a new lens, developing a broader spectrum of literacies, and reinforced the usefulness of engaging in multiple literacy discussions.
Stewart, R. A. (1990)	PST N= 200+ Under-graduate and graduate education majors Content area methods course	QUAL Four data sources: group discussion; narrative evaluations; academic journals, interviews.	Constant comparative analysis, content analysis, triangulation	Resistance	Several categories emerged: constraints of the workplace (time constraints and socio/political factors). Although they recognized the benefits, PSTs felt constricted by time to cover content and teach reading. Overall, content area literacy was not perceived as a feasible pedagogical tool in the realities of the classroom and workplace constraints.
Stewart, R. A. & O'Brien, D. G. (1989)	PST N=100 from a random sample of 3 semesters, total of 12 courses at 15-25 students each session. Content area reading course	QUAL Questionnaire, journals, open-ended questions, interviews	Generative and exploratory analysis, constant comparative analysis	Attitudes Misconceptions Resistance	Content area reading instruction misconceptions are prevalent with PSTs entering a content reading course. Upon completion the misconceptions are no longer present, but when in the teaching situation, there may be limited opportunities for strategy incorporation.
Sullentic-Dowell, M. M., Beal, G. D., & Capraro, R. M. (2006)	PST N=129 (123 F, 6 M) (113 C, 16 AA) Three literacy courses: Lit I: theoretical foundations, Lit II: Pedagogical practices, Lit III: Assessment	QUAL Estes Attitude Scale, questionnaires, interviews,	Constant comparative analysis	Attitudes Beliefs Experiences Strategies	The level of active reading for PSTs can impact instruction. PSTs do not dedicate time to reading, but are capable readers. Although they claim reading as important and have a positive reading attitude, their habits did not reflect in their teaching.
Warren-Kring, B. Z. & Rutledge, V. C. (2011)	PST N=46 (9 English) (4 math) (22 social science) (7 science) (1 art) (3 Spanish) 2 groups of middle school students Intervention (N=46) Comparison group (N=47) Adolescent literacy course	QUANT Pretest and posttest Reading interview Bader Reading & Language Inventory for comparison and intervention groups. Perception/attitude survey (PSTs)	Repeated measures analysis of variance, analysis of variance	Applications Effectiveness Practice	PSTs who participated in a semester long literacy course and who were involved in a field placement of one-on-one tutoring resulted in positive attitudes of the PSTs. Both tutees and tutors showed positive gains from the experience.
Welle, D. W. (1981)	PST N=64 Content area methods course	QUANT Scale to measure teacher attitudes (Vaughn, 1977). Pretest and posttest questionnaires	Descriptive analysis	Attitudes	A reading methods course leads to more positive attitudes of PSTs toward reading instruction in content area classes.

Wilburne, J. M. & Napoli, M. (2008)	PST N=8 Mathematics methods course	QUAL Interviews, reader response journal / notebook, written responses pre and post, mathematical autobiography, field notes, lesson plans.	Thematic and categorical coding, triangulation	Beliefs Knowledge	Eight PSTs in ELA and mathematics methods courses show a significant positive shift in the participants beliefs, interest, and benefits of teaching math with the support of literature.
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APPENDIX B

INCLUSIONARY INSERVICE TEACHERS STUDIES

<u>Study Author(s), year- alphabetical</u>	<u>Population & # of participants and setting:</u>	<u>Research Method & data source: Qualitative (QUAL) Quantitative (QUANT)</u>	<u>Data Analysis</u>	<u>Research Focus:</u>	<u>Study Findings</u>
Adams, A. E. & Pegg, J. (2012)	N=26 science and mathematics teachers for two years Grades 6-12 (7 science) (12 mathematics) (7 both science & mathematics) two summer-long workshops	QUAL Online discussions, Field notes, classroom observations, lesson plans, reflections, student work for two years	Observation protocol, coding, triangulated findings and pattern analysis	Enactment and adapt to use Professional development encouragement Increase awareness	All participants incorporated content-area literacy strategies into instruction adapted for the contexts of their classroom. The teachers applied the strategies to the goals and instruction of their class, content, and current practices. With conflict, this did not result in failure to implement strategies, rather the need to modify to minimize conflict within their classroom practices and goals for instruction.
Alger, C. (2009)	N=4 (2 biology) (2 English) Teachers in their first year of teaching	QUAL Descriptive case study, Self-reporting Consecutive lesson plans, powerpoint presentations, transparencies, handouts, worksheets, readings, reference materials, observations, semi-structured interviews, questionnaire	Simple statistics and counts, identification of patterns, themes, case studies and thematic analysis	Transference Strategy use Barriers	From the formal observation, there was some transfer of learned knowledge and strategies to the practical application in the INSTs' classes. The INSTs teach reading as it pertains to their specific content. The implementation of content-area reading strategies for first-year teachers is challenging. The INSTs were knowledgeable and taught valid and well thought out.
Alvermann, D., Friese, E., Beckmann, S., & Rezak, A. T. (2011a)	N=2 prospective math teachers were paired with (N=2) middle school teachers. PST & INST	QUAL Emails between all participants and researchers, the course syllabus, instructional texts, lesson planning, lesson plans, professor's feedback, semi-structured interviews	Bourdieu's cultural capital (both institutional and embodied), field, and misrecognition were selected as analytic tools.	Practice Knowledge Understanding Professional development (online)	The study results indicated that despite the focus of the study on domain knowledge through pedagogical mentoring, knowledge was effectively integrated with varied reading instruction. While reading teacher educators support practicing math teachers in content area instruction, there is a direct need for other sources of math for cultural capital.
Alvermann, D. E., O'Brien, D. G., & Dillon, D. R. (1990)	N=25 middle school teachers (19 F, 5 M, 20 C, 4 AA) 2 semesters Beginning to 10 years of experience (6 social studies) (9 English/Lang. Arts) (6 science) (2 health and human development	QUAL Field notes, videotaping and audiotaping lessons, structured interviews, observation,	Constant comparative analysis	Discussions	Middle school classroom discussions range from lecture, recitations, to open forums. The teachers lesson purpose influences the discussion. When facilitating comprehension, the discussion is most likely to be an open forum style. There were discrepancies between the intellectual definitions and the comments in the interviews. While teachers' interview statements reflect the fear they have for letting the students get out of control. Although discussions are instructional activities, they are also tools for social control that empower teachers

Alvermann, D. E., Rezak, A. T., Mallozzi, C. A., Boatright, M. D., Jackson, D. F. (2011b)	N= 1 PST in science and math secondary concentration.	QUAL Intervention lesson plans, emails containing reflections	Case study, discourse analysis, coding, inductive and deductive content analysis, interpretive data	Reflective practice Online learning	In conclusive whether or not the PST might use one reading strategies used and implemented in her intervention lessons. She produced a concept map that depicted the relation between science concepts and the specific vocabulary terms. By providing students with opportunities for approximations in online courses, this can be useful for the student(s).
Bryant, D. D., Linan-Thompson, S., Ugel, N., Hamff, A., & Hougen, M. (2001)	N=10 6 th grade middle school teachers (general and special education) (10 F, 8 C, 2 AA) 1 to 25 years experience 4-month professional development	MIXED Pre and postinterviews, professional development evaluation forms, Intervention Validity Checklists (Vaughn et al., 1998), notes.	Analyzed and coded for frequency, descriptive statistics	Knowledge, instructional practices, barriers, perceptions	Numerous challenges for INSTs when teaching content area and using text-based material. Teachers are overwhelmed with issues of low socioeconomic status and the needs of English Language Learners. Although overwhelmed, the teachers provided adaptations for struggling students and recognized the need for instruction. The professional development had positive opinions and outcomes. Authentic literacy projects enhanced student learning. As gained from this research, teachers need to use the textbooks, but also provide supplemental resources.
Bryce, N. (2011)	N= 4 primary-grade teachers	QUAL Classroom observations, field notes, Interviews, lesson plans, curriculum materials, blank worksheets, samples of students' written work.	Naturalistic and holistic procedures	Challenges with using textbooks	Even with the challenges of teaching primary students with textbook-based instruction, teachers fostered a meaning-based approach to reading nonfiction. The students benefited from the focused instruction as teachers taught reading with strategies. The learning opportunities increased.
Cantrell, S. C., Burns, L. D., Callaway, P. (2009)	N=31(final number=28) Middle-and high-school content-area teachers (23 F, 8 M) Content literacy professional development project (year-long) (7 science) 8 English/ language arts) (7 mathematics) (4 social studies) (2 reading)	QUAL Interviews (30-45 minutes), transcripts, observation (videotapes)	Analytic induction	Beliefs (perceptions) Professional development program	Content-area teachers believe that integrating literacy techniques into content area instruction and viewed themselves as content area teachers and literacy teachers. It was reported that the content literacy professional development project provided and supported the teachers' self-efficacy with literacy and content-area literacy practices. Professional development with cross-curricular connections, teamwork and collaboration, and coaching in content-area literacy instruction can have positive influences on content-area teachers' beliefs and perceptions of teaching literacy in the content-area.

Cantrell, S. C., & Hughes, H. K. (2008)	N=22 6 th and 9 th grade classroom teachers Content literacy professional development project (year-long) (7 science) 8 English/ language arts) (7 mathematics) (4 social studies) (2 reading)	MIXED Pre and post surveys Observations Interviews	Paired sample <i>t</i> tests bivariate correlations Two-level coding system and attribution frequency of themes	Efficacy Implementation Perceptions Professional development program	Results indicated that teachers' personal and general efficacy of literacy teaching showed improvement. Teachers' with higher efficacy at the beginning of the professional development were more likely to recommend the implementation of the content-area literacy practices. The coaching and collaboration were factors for developing the teachers' sense of efficacy and the implementation of content-area literacy strategies.
Carter, T. A., & Dean, E. O. (2006)	N= 8 classroom mathematics teachers Mathematics clinic and tutoring instruction for 3 hours day, for four days a week, for three weeks the teachers worked with an individual or pair of students.	QUAL Audiotapes, notebooks, lesson plans, hours of interaction of instruction. For triangulation, the artifacts were jointly analyzed.	Commonalities through comparisons, categorical comparisons, comparative analysis	Frequency of reading instruction,	Participants inherently taught their students reading strategies while instructing mathematical concepts. And the teachers encouraged and developed student mathematical reading comprehension through the use of read alouds and discussions.
Conley, M. W. (1986)	N= 3 middle school teachers (3 M) 8 years average of experience,	QUAL Knowledge test, open-ended questions, created and conducted three lessons, lessons were audiotapes, transcribed, and analyzed.	Classified responses, scored for correctness.	Knowledge, instruction, Professional development	Training related to the instruction, indicates that teachers would be knowledgeable about the purpose, goals, and procedures. Teachers often avoid literally questions and focus on the interpretative questioning. The training model and the three-level question technique was viewed as good and supportive for teaching the lessons.
Curwen, M. S., Miller, R. G., White-Smith, K. A., Calfee, R. C. (2010)	N=18	MIXED Longitudinal case study, audio-taped teachers semi-structured interviews, videotapes of professional development day, teacher talk-back IOWA Test of Basic Skills Reading Subtest, IOWA Writing Assessment, researcher-developed reading-writing assessment.	Grounded theory, qualitative software HyperRESEARCH, patterns, codes,	Meta-cognition Professional development Instructional strategies	During the RWC teachers gained knowledge and information about implementing reading and writing in the content-area class. A common complaint is that strategies are thrown at them all the time, but are never instructed at how to use them and make them part of the instruction. Overall the RWC can help students' learning and brought it into a form of metacognitive learning, based on reflection and extension practices. Participants report that the PD provides the teachers with an effective model of professional development that supports the teachers in their own metacognitions, as well as awareness of pedagogical practices.

DiGisi, L. L. & Willett, J. B. (1995)	N=184—and 16 teachers were interviewed from the questionnaire sample	MIXED Questionnaire, interviews Self-reporting data	Constant comparative with preliminary categories Principal components analysis Multiple regression Univariate descriptive statistics	Instructional use Textbooks	The study determined that biology teachers modify their instruction and use of textbooks according to the academic level of the students in the biology class. In the classes with lower academic achievement, the teachers provided the students with many reading activities, but expected the student to gain the biology content while in class. For the classes with higher academic levels, the teacher expected the student to learn from both the independent reading as well as the classroom instruction. The biology teachers viewed reading and the inquiry activities as vital components to the learning of biology. However, the biology teachers were unsure of when and how to incorporate the reading comprehension strategies in to their science instruction.
Dowdy, J. K. & Campbell, D. (2008)	N=11 teachers (11 M) (science, social studies, physical education, and art) PST & INST	QUAL Case study Triangulation, prolonged engagement, peer debriefing, member checks, and thick description. Transcripts, audiotaped interviews, reflections	Constant comparison, Inductive categories and questions emerging from the data	Knowledge Reflective Enhance reading and writing instruction	Three themes emerged from the questioning: what was learned in the arts-based class, examples of what is used, and the rationale behind using arts-based educational instruction in content-area classes. The teachers involved gained knowledge and information about teaching diverse students. The teachers provided evidence of growth of teachers and leaders who value the arts.
Dupuis, M. (1978)	N=59 Junior high school teachers Content-areas: English, reading, social studies, science/mathematics, related arts	QUANT Pre and posttests: Reading knowledge test, criterion-referenced test. Statements survey Situations survey The teacher opinionnaire	Analysis of variance Matched pairs <i>t</i> -test	Attitudes	Reading teachers are knowledgeable of reading instruction, however, they need help prior to becoming effective resource teachers for content-area teachers. This can cause tension between content-area teachers. English teachers, according to this study, at the entry level of reading instruction are the best prepared. Pre and posttest scores indicated that only two groups showed consistent change on all five measures, which was the science/math group and the related arts group. After the pretest, English and reading scores were minimally higher than the other three groups pertaining content-area reading, but there was no significance on the posttest scores.
Dupuis, M., Askov, E. N., Lee, J. W. (1979)	N=57 Junior high school teachers (F 36, M 21)	QUANT Pre and posttest Statements Survey Situations Survey Knowledge of Reading Skills Test, criterion-referenced test	Three-way analysis of variance Two-way analysis of variance	Attitudes Content area reading project Knowledge	The teachers in the experimental group indicated significantly more change in their attitudes than the content group. Reading skills and perceptions of their own reading improved significantly. A yearlong content area reading program/in-service significantly changed the teachers' attitudes toward using and integrating content-area literacy.

Fang, Z., Lamme, L., Pringle, R., Patrick, J., Sanders, J., Zmach, C., Charbonnet, S., & Henkel, M. (2008)	N= 2 6 th science teachers Monthly workshops Home science reading program	MIXED Gates-McGinitie Reading Tests, Curriculum-Referenced Science Test, minutes from the monthly meetings, debriefing sessions, classroom observation notes, summative reflective paper, email communications, surveys	<i>t</i> -tests, analysis of covariance, paired <i>t</i> -tests, inductive, constant comparative	Attitudes, Beliefs, Knowledge Professional development Textbooks	The two teachers embraced the reading instruction for science content. Reading was not just textbooks, but the use of reading strategies. Attitudes and beliefs were changed and reinforced their commitment to innovation and curriculum instruction.
Fisher, D. & Frey, N. (2008)	N=88 teachers, 1-37 years experience, average years teaching 9.5. (n=10 randomly selected for interviews. N= 500 students (sophomores, juniors, & seniors in high school). (n=12) student interviews.	MIXED Surveys, interviews, observations	Quantified to determine frequency, central tendency, constant comparative	Beliefs, perceptions, professional development	Teachers were least comfortable with the instructional strategy of reciprocal teaching and requested more information. While the social studies teachers ranked anticipatory guides as the most helpful. When teachers had difficulty with a strategy they were resistant to teach with it again. The read aloud and shared readings were favorable among the teachers and were often considered for implementation.
Friedland, E. S., McMillen, S. E., & del Prado Hill, P. (2010)	N= 6 middle school mathematics teachers (5 F, 1 M), experience ranged from 8 months to 3 years.	QUAL Literacy Awareness Checklist, observations, interviews, audiotapes of teachers interviews and class lessons, literacy definitions	Constant comparative analysis with emerging themes	Strategy use, attitudes, knowledge	Although the participating math teachers were familiar with the need and purpose of content area literacy strategies for the content area, they lacked the background to promote integration in their own class. There is a gap between PST preparation and INST practice. There is a need for strong relationships between the content teachers and the literacy instructors.
Gerber, T. & Gerrity, K. W. (2007)	N=257 music teachers	QUANT Questionnaire	Descriptive statistics, analysis of variance, <i>t</i> -tests	Attitudes	According to the research, a recent shift in teacher preparation has shifted teachers' behaviors. The participating music teachers have positive attitudes toward reading instruction in the content class, although not overwhelming. However, there are still obstacles to teaching content-area literacy. The teachers had favorable attitudes towards teaching reading, but there was no significant difference for teachers who did not have training in their preservice program.
Guzzetti, B. J. (1989)	N= 6 secondary teachers (science, mathematics, and music).	QUAL Observations, anecdotal record of field notes and video tape observations, semi-structured interviews, informal and formal interviews focused on planning, teaching, analyzing, evaluating, applying of teachers' decision making.	Constant comparative, compared across categories, within, between, among categories	Attitudes beliefs Instructional behaviors	There are differences between specific content areas and the strategies implemented for instruction. Competing demands of the teachers and administrative support. Not only do teachers need to be prepared to teach strategies, but the content in general. When teachers lack the content training, teachers focus on the content, rather than literacy strategies. Contextual constraints demand time and support.
Hairrell, A., Rupley, W. H., Edmonds, M., Larsen, R.,	N= 36 4 th grade social studies teachers 18-week	MIXED Demographic survey, online logs, audio-recorded intervention	Qualitative analysis, categories and majors themes	Knowledge, teacher quality Professional development,	From the data analysis, participants indicated three variables were related to the student performance. Teacher

Simmons, D., Willson, V., Byrns, G., & Vaughn, S. (2011)	professional development.	implementation lessons, teacher qualifications, open-ended survey items, instructional proficiency forms (students): GMRT-4 Curriculum-based vocabulary (CBN-V), (TAKS), pretest and posttest data	Pearson Correlations, structural equation modeling	perceptions	quality and fidelity both positively were related to student achievement. While the teachers who stayed aligned more closely with the PD materials and instructions, students showed a greater achievement gain. Teachers reported that they believed that the instruction was having a positive influence on the students' vocabulary learning and comprehension.
Kinney-Sedgwick, M. (1996)	N= 15 5 th grade teachers (9 F, 6 M) (social studies and history) N= 4 university professors (1 F, 3 M)	QUAL Interviews, open-ended questions, audio-taped and transcribed	Analytical induction, check-coding, coding themes or constructs, pattern coding,	Views Textbooks	The majority of the participating teachers' perspectives of learning represent a traditional transmission model. The teachers were dependent on their text and accompanying materials and used a highly structured learning as knowledge transmitters. Distinct differences between using textbooks by teachers, compared to literacy professors-teachers closely used textbooks, while professors do not hesitate departing from it and using a variety of sources.
Konopak, B. C., Readence, J. F., & Wilson, E. K. (1994)	BOTH N=125 pst and inst teachers representing 10 areas, 58 pst and 46 inst secondary teachers education Content area methods course	QUANT Kinzer's (1989) instrument adapted Belief statements, lesson plans	Chi-square	Beliefs Orientations	With several limitations to the study, results indicate difference between the groups' orientations. PSTs favor interactive explanation of how reading happens, INSTs favored reader-based. For beliefs about reading, both PSTs and INSTs showed significant results for the reader-based orientations. The findings provide support that suggest that theoretical orientations of reading processes of teachers' reflects their instructional decision making process.
Lawrence, S. A., Rabinowitz, R., & Perna, H. (2008)	N= 11 secondary ELA classrooms Study 1: 6-mont investigation of 9 secondary ELA teachers Study 2: teacher-researcher Study 3: teacher-researcher	QUAL Semi-structured interviews and four classroom artifacts: (a) teaching resources and materials, (b) lesson plans, (c) portfolios, and (d) student work Field notes, memos, summaries Dyadic peer talks, discussions-tape recordings Student portfolios, student journals, assessments, lesson plans, observations data recorders in the teacher's reflective journal.	Multi-step, recursive, systematic process of patterns and themes in the data grouped in similar events to create typologies, Discourse analysis Discourse and content analysis	Practices Reading strategy selection and use	Study 1: Teachers reported that opportunities were provided for students to make connections for all types of texts. Text selection was based on expressed student interest and students were able to apply content-area reading strategies. The teacher-student conferences provided valuable information and insight and were used with 6 of the 9 teachers. This also helped to focus on the individual needs of the students. The English-language arts teachers combined literacy and literature, with various groupings, and reading comprehension strategies. Five of the nine taught the same strategies. Study 2: the dyads needed facilitated meaningful discussions. Using this strategy is beneficial for the students that are resistant as readers. Study 3: when the teacher-research used a balanced literacy approach she observed that students could provide more details about the story and instruction. Once the students

					had gained the knowledge of a new strategy or technique, it was beneficial for their reading and comprehension.
Mallette, M. H., Henk, W. A., Waggoner, J. E., & DeLaney, C. J. (2005)	N= 90 middle school teachers	MIXED Survey and open-ended questions	Frequency, analysis of variance, <i>t</i> -tests, content analysis, coding schemes,	Literacy instruction, beliefs	New literacies among the participants were not as essential to basic literacies in terms of practice and basic literacies were more positive. Strong similarities between the quantitative and qualitative findings, but the qualitative provided some additional insights. In response to "every teacher is a teacher of literacy" all participants and disciplines were strongly supportive that literacy should be integrated across the curriculum. Teachers overall felt that they were responsible for literacy instruction.
McKeown, M. G., Beck, I. L., Blake, R. G. K. (2009)	N= 6 intact 5 th grade classes N= 6 5 th grade teachers and 3 support staff = 9 (8 F, 1 M)	MIXED Lesson-text comprehension, lesson-texts-assessments. Classroom discussion transcripts from two of the five lessons, observations, audiotaped class lessons, exit interviews.	Analysis of variance and analysis of covariance, analysis of narrative texts and transcripts	Knowledge Strategy instruction Attitudes Content	From the first year, there were no differences of lesson-text comprehension, but the SVT showed differences on the lesson-text measure. A lack of difference suggested that the approaches did not provide the students with advance purposes for strategy uses. From the interviews, strategy teachers were satisfied and the basal-comprehension teachers were not satisfied with the approach and feeling natural teaching it. Five of the six teachers reported that they saw benefits in the use of the strategy approach. The comparison of the two approaches resulted in consistent findings, indicating that the lesson design and the instructional approaches were constant over the duration of the two cohorts.
Moje, E. B. (1996)	N= 1 teacher and her high school students (n=22), and (n=7) students interviewed	QUAL Intensive, long-term observation of a natural cycle of classroom culture, daily classroom observation, field notes, structured, semistructured, and informal interviews, audio and videotaped transcripts of daily lessons, artifacts, textbooks, handouts, laboratory exercises, Secondary data collection for students	Ethnography, constant comparative, identified emerging codes	Beliefs Practices	According to the analysis and interpretation, literacy was practices as a tool for helping the students to organize thinking and learning in the content. Literacy instruction was part of the teacher-student relationship, and the practice of literacy was an organizational tool and supported in the class culture. Literacy was supported by the views of the teacher and students. Participation was a commitment of the students, they used strategies taught and reinforced in the class and content. Findings explicitly support previous research that teachers should explicitly integrate and teach literacy strategies they can transfer to other domains of instruction and content-areas.

Muth, K. D. (1993)	N=99 Middle school mathematics teachers (94 F, 5 M)	QUANT Questionnaire	Pearson Correlation, descriptive statistics, frequency	Beliefs Practices Knowledge	Participants indicated that they are generally undecided about their beliefs about how reading plays a role in the learning of mathematics, and their role as the teachers in helping their students understand the reading of mathematics. They also said that they did not view textbooks as the major source of learning, but in contrast the teachers indicated that the textbooks are the primary source implemented in the classroom.
Ness, M. K. (2008)	N= 8 secondary science and social studies teachers	QUAL Observations, open-ended teacher interviews	Tally, coding, categorical analysis	Attitudes Instructional strategies Knowledge	Explicit reading instruction was not as significant way for teachers to assist struggling readers. Teacher-dominated instruction was a common trend, and didactic instruction. Multiple modalities were utilized for instruction and to help increase students' comprehension and retention. For content-area teachers to support struggling readers, teachers relied on compensatory strategies, multiple presentations, and heterogeneous groupings.
Ness, M. K. (2009)	N= 8 (4 middle school and 4 high school teachers) (2 MS science) (2 MS social studies) (2 HS science) (2 HS social studies)	MIXED Classroom observations, Open-ended interviews, (The Didactic Instruction of New Material and Didactic Instruction of Review Material)	Frequency, categories, coding, disaggregating,	Attitudes Perceptions Beliefs Instructional practices	During 600 minutes of HS social studies, no explicit instruction for reading comprehension occurred and nearly no reading comprehension instruction. While in the MS, there was slight more focus on reading comprehension than at the HS level. Although the majority of the teaching believed that reading was important to the instruction and the learning of the content, little emphasis or no instruction of reading comprehension was provided in the class setting. The focus of the instructional responsibility was on the content rather than the comprehension and understanding of the content. The teachers identified as content specialist, with an understanding of reading comprehension, but adverted the responsibility. The participating teachers lacked professional knowledge and saw training as a barrier to reading comprehension instruction.
O'Brien D. G., & Stewart, R. A. (1990)	BOTH N=245 PSTs and 5 teachers Content area methods course	QUAL Precourse statements, surveys, learning logs, interviews	Constant comparative analysis	Resistance	Resistance to content-area reading instruction: is based on global perceptions and viewed incompatible. Based; on simple misconceptions; what appears to be resistance is a broader complex of PST's assumptions.

O'Rourke, W. J. (1980)	N= 120 high school content area teachers.	QUANT Questionnaire	Analysis of variance	Attitudes	Generally speaking, there were no statistically significant differences in attitudes between the junior and senior content teachers related to teaching experience. However there were differences between the content areas taught. ELA were positive, while the other groups were average. These results were anticipated: English-language arts are more directly related to reading.
Park, T. D. & Osborne, E. (2006)	N=4 agriscience teachers	QUAL Teacher and students interviews, audiotaped and transcribed interviews, classroom observations	Themes and assigned codes, thematic analysis	Perceptions Attitudes Challenges Knowledge	The teachers in the comparison group implemented twice as many content-area literacy strategies as the treatment group. The students gained the same level of agricultural comprehension and motivation as the students in the treatment group.
Park, T. D. & Osborne, E. (2007)	N=216 agriscience teachers	QUANT Survey/ questionnaire	Descriptive statistics, <i>t</i> -tests, bivariate correlation, stepwise regression	Knowledge Strategies Attitudes Practices	The participating teachers held positive attitudes about reading for personal use and as an instructional tool. However, the teachers lacked knowledge and resulted in a low frequency of use in the classroom.
Quinn, R. J. & Wilson, M. M. (1997)	N= 21+17+25 (elementary, middle, and high school mathematics teachers)	MIXED Questionnaire Open-ended questions	One-way analysis of variance Open coding	Beliefs Practices Attitudes Strategy use	There was no statically significant difference between the groups and attitude toward using writing in the teaching of mathematics. Time constraints are a continued issue-there is limited class time and prevented them from using writing to teach math concepts. Although teachers have favorable attitudes of literacy in math classes, these practices are not applied in instruction and writing instruction is included less than once per week.
Ratekin, N., Simpson, M. L. Alvermann, D. E., & Dishner, E. K. (1985)	N=8 content area classroom teachers (math, science, social studies, and ELA)	QUAL Classroom observations and document analysis, 1-minute intervals of recording, 40 sessions and 2000 observations	Matrix of data, categories, tallies, participation observation and categorical analysis	Instructional practices Resistance Textbooks	Teachers assumed the responsibility of presenting and clarifying concepts during instruction. While ELA and math devoted little or no time to small groups, social studies and science dedicated 4% and 12%, respectfully. There was little variance in whole class instruction, as lecture, discussion, or monitoring seatwork were the most popular forms of delivery. As strategies were used and implemented, the purpose and framework provided new information, and during the next step, information was gained through text, lecture, and media, and lastly, the large amount of time was allocated for instruction and information time. Most commonly used is the textbook, and in contrast, the textbook authors recommend using supplemental sources.

Shanahan, C., Shanahan, T., & Misischia, C. (2011)	N= 8 per team X 3 teams = 24	QUAL Individual interviews, expert think-aloud protocols, focus group meetings—were all audiotaped and transcribed.	Constant comparison, coded reading processes	Disciplinary literacy Knowledge	The three disciplinary areas differ in how they read and interact with texts in their specific disciplines. There are times when the experts engage in similar strategies for instruction, but the ways are varying and unique.
Simmons, D., Hairrell, A., Edmonds, M., Vaughn, S., Larsen, R., Willson, V., Rupley, W., & Byrns, G. (2010)	N=48 elementary 4 th grade social studies teachers (43 F, 5 M) N= 911 4 th grade students from 61 social studies classes	QUANT Pre and posttests: Gates-MacGinitie Reading Test—4 th edition—Passage Comprehension Subtext, Test of Reading Comprehension, Social Studies Vocabulary Subtest, Curriculum-Based Vocabulary Assessment, Social Studies Content Test, The TAKS, Test of Silent Contextual Reading Fluency	Descriptive statistics, Chi- square Structure equation modeling with hierarchical linear model framework	Strategy interventions Professional development	There were reliable differences that favored both of the experimental conditions over the typical practice of the social studies content measure. The students in the vocabulary instruction outperformed their peers in the curriculum-based vocabulary assessment.
Smith, F. R. & Feather, K. M. (1983)	N= 18 students in 3 classes N= 3 teachers (social studies— 2 middle school, and 1 high school)	QUAL Systematic daily observations, interviews, written recording notes and quotes	Ethnographic— naturalistic approach	Perceptions Practices Instruction	It may be suggested that reading is not as important of a component of content courses, since little reading was assigned in the classes in this study. Perceptions and goals vary between the teachers and the students. Students –factual learning, teachers emphasize citizenship, and cognitive objectives.
Smith, R. J. & Otto, W. (1969)	N= 19 junior and senior high school teachers.	QUANT Pre and post instruction testing Attitude inventory Nelson-Denny Reading Inventory Tests, forms A & B.	RAVE (Reciprocal Averages Computer Program)	Professional development Attitudes	From the questionnaire, 13 of the 19 participants provided evidence that the reading course had positive outcomes. While 11 said they were more willing to include reading practices into their instruction. Seven indicated that they were already incorporating strategies into their class practices. Concurrently, the students were happy about increasing their reading abilities.
Strahan, D., Geitner, M., & Lodico, M. (2010)	N= 49 high school teachers	QUAL Participant observers, interviews, observations, field notes, focus groups, and archival documents	Case reports, patterns, narrative reports, chronological analyses	Professional development Literacy coach Implementation Strategies	In order to establish a purpose and a strong role, the coach invested a large amount of time and energy; she focused on making and building relationships with the participating teachers. The collaboration between the individuals grew to include clusters of colleagues who were teaching the same content areas, and also involved grade-level teams. The literacy coach at this high school, though two years of collaboration with the initiative, they strengthened classroom practices that also integrated content-area literacy strategies into the classroom practices. The groups and clusters grew out of this practice, and there was a shift to learning communities. This research supported previous by other researchers, the teachers were more focused

					and accomplished.
Sturtevant, E. G. (1996)	N= 2 high school history teachers	QUAL Extended autobiographical interviews (semi-structured), classroom observations, classroom documents, notes, informal discussions, and interviews and data collected from students and administration	Analysis took place during and after with transcribed and anecdotal documents Constant comparative	Beliefs	Teachers' beliefs are strongly affected by the personal relationships with trusted peers, colleagues, teacher-friends, previous or current role models, and other students.
Sturtevant, E. G., Linek, W. M. (2003)	N= 9 content area middle and high school teachers	QUAL Cross-case analysis, ethnographic techniques to gather and analyze data from the participants. Semi-structured interviews, classroom observations, artifacts and photos of the teachers' instruction	Coding for themes and categories, cross-case analysis, and grounded theory to frame inductively, categorical analysis	Beliefs Perceptions Teaching practice	All nine participating teachers had strong beliefs about meeting the learning needs of their students. As well as the value of interpersonal relationships, and lifelong learning. The teachers also reported effects of their own personal experiences, conditions, and professional development. The participating teachers overall had a strong focus of using literacy as an active and engaging learning tool in the classroom while meeting student needs.
Theriot, S. & Tice, K. C. (2009)	N= 6 middle school teachers Experience ranging 3 to 23 years Case study n=1	QUAL Case study, semi-structured interviews, classroom observations, beliefs instrument (Leu & Kinzer, 1995)	Case study and themes, thematic analysis	Beliefs Practices Knowledge Professional development (workshop)	A teacher belief impact what is taught and fosters students' learning. It is important to understand the need and purpose of instruction as well as the relationships between beliefs and practices. Teachers need to have a deeper understanding of the theoretical and philosophical underpinnings. Through the professional development, the teacher developed and gained awareness of teaching, appropriateness of instruction and additional struggle within the classroom (i.e. classroom management).
Tixier y Vigil, Y & Dick, J. (1987)	N= 237 (67 social studies teachers and 170 teachers in other areas [e.g. English, math, and science])	QUANT Surveys/ questionnaire	One-way analysis of variance	Attitudes Beliefs Perceived use Reading strategies Textbooks	The only major differences determined were between junior and senior high school teachers was found in the "during" reading strategies. The junior high allowed time in class for reading, and was rated higher. While senior high teachers rated the desirability of reading higher than the self-report. According to the study, the social studies teachers perceived to have a higher perceived use of reading strategies. The differences between the ratings for attitudes were not trivial, but teachers often fail to implement strategies they believe to be important. And social studies teachers report that they use reading strategies more frequently than the science and math teachers.
Wedman, J., & Robinson, R. (1988).	N= 50 secondary teachers (English, mathematics, history, and science)	MIXED The Concerns Based Adoption Model Readiness questionnaire	t-test, percentages	Professional development (in-service) Attitudes Knowledge	The results reported from the study indicated that the professional development (in-service) sessions showed significant influence on the

		Use questionnaire Open-ended questions, pre and posttest		Strategy use Concerns	secondary teachers' attitudes, knowledge, concerns, with the use of content-area literacy strategies.
Wilson, N. S., Grisham, D. L., & Smetana, L. (2009)	N= 22 secondary teachers	QUAL Lesson plans, open- ended questions, single case study,	Themes and patterns were analyzed coded, recursive process, thematic analysis	Professional development Knowledge QAR Understanding Metacognitive	The participating teachers learned about the QAR strategy and the framework of the instruction. They demonstrated knowledge in their reflections and through this process their descriptions changed. As the PD progressed the teachers gained a deeper understanding of the QAR strategy, and their lesson plans demonstrated a declarative understanding of the QAR benefits.